The Birth and Diffusion of Four Year Degree Granting For-Profit Colleges and Universities in the US, 1975-2012

By

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Submitted to the graduate degree program in Educational Leadership and Policy Studies and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Abstract

For-Profit Colleges and Universities (FPCUs) are one of the most controversial forms of post-secondary institutions in the United States and perhaps across the world. Today, 25 percent of all degree granting institutions in the country are identified as FPCUs. The purpose of this study is to offer a theory based, national level explanation for the birth and diffusion of FPCUs that emerged in the higher education industry since 1975. Two organizational founding theories were employed to understand the FPCU phenomena: (1) Neoinstitutionalism, and (2) population ecology theory. Using event-history data on FPCU foundings and environmental conditions of the founding locations from 1975-2012, I assessed the effect of ecological and institutional predictors on the odds of FPCU foundings.

The results of this study suggest that urbanization as population growth and formation of economically integrated locations has the strongest effect on foundings, followed by prior foundings. The supply and the demand of human capital, lack of competition from incumbent public universities and the availability of regional accreditation for FPCUs were also predictive of foundings. The results of this study also suggest that differentiated demand for college education rising from urbanization supported the emergence of FPCUs. This trend has policy implications because it points to the need for capacity building in urban areas. This study is only a first step effort in understanding the emergence of FPCUs, therefore this study concludes with suggestions for future research on the evolution and survival rate of FPCUs

Key words: For-Profit Colleges and Universities, Organizational Founding theories, Population Ecology and Neo-institutionalism

Acknowledgements

The completion of this dissertation represents the fulfillment of a dream that was buried in some remote corner of my heart for a very long time. Over the years, other life commitments took priority over my personal aspirations and I suppressed this dream further down the list that it almost disappeared completely. Then about ten years ago a major twist happened in my career. I joined the Metropolitan Community College of Kansas City as a Director of Research and Planning. This career move introduced me not only to the world of post-secondary education but also to some of the most disadvantaged students of Kansas City. As a transplant from business management, I was surprised by the institutional climate and the administrative practices of MCC, an urban college of 30,000 students. Many things I witnessed and experienced at MCC were at odds with my idea of equal opportunity in higher education.

Many of my questions found answers in *Dr. John Rury's* class on "Higher Education in the United States". He influenced the trajectory of my scholarly inquires. Then, *Dr. Argun Saatcioglu* taught me organizational theories and their applications. I am grateful for his relentless support that helped me to complete this dissertation. I would like to thank *Dr. Susan Twombly and Dr. Lisa Wolf-Wendel* for their time and support. Without their guidance and genuine support, I would have never been able to realize this dream. Thanks to Dr. *Eugene Parker* for his support. *Dr. Eric Hanley,* my minor adviser from Sociology department also offered his selfless support. I also am grateful to my friend Dr. *Elizabeth Lindquist* who insisted that KU is a good place and my curiosities must be explored. Finally, I am grateful to my husband *Sunny* and our children *Rashmi, Roshan, Tim* and *Erica* for their encouragement and support. I am most grateful to Tim for teaching me stata and other aspects of data analytics. Finally, this dissertation is dedicated to my three grandchildren *Aiya, Malina* and *Samir*.

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Chapter 1

Introduction

Overview

In many ways, the present day For-Profit Colleges and Universities (FPCUs) are an enigma. They are simultaneously described as old and new, big and small, legitimate but often engaged in illicit activities, market based profiteers though supported by public dollars, greedy yet altruistic by serving mostly low income students (Breneman, Pusser & Turner, 2006; Harkin, 2012; Kelly, 2001; Kinser, 2006; Morey, 2004; Ruch 2001; Tierney & Hentschke, 2007). Much of the discussion on the nature and scope of for-profits is "ideological," lacking rigorous theoretical grounding and robust empirical evidence. This study seeks to identify the factors and conditions associated with the emergence and diffusion of present-day for-profit colleges and universities. In this study, FPCUs are defined as regionally accredited, four-year or above degree granting for-profit colleges and universities.

This study offers a population[1] level explanation for the emergence of the FPCU organizational form in the higher education industry since 1975. The study theorizes that the interplay of organizational and environmental factors could offer explanations for the birth of this organizational form. Environmental factors such as the density of population in a locale, the economic developments in geography, the changes in the economic structure of the geography, the availability of human capital as labor market resources, and organizational factors such as the presence of other colleges and universities could offer a field[2] level explanation for the emergence of FPCUs.

[1] FPCUs as a group of colleges and universities
[2] The field of colleges and universities

The scope of this study is national and it uses longitudinal data on institutional characteristics from the annual survey of colleges and universities reported in the Integrated Post-Secondary Educational Data Systems (IPEDS) by National Center for Educational Statistics (NCES). Additionally, federal government data on US employment trends by industry sectors, levels of educational attainment by age groups, institutional accreditations, and the title IV federal student financial aid eligibility of colleges and universities were gathered from respective agency websites. I utilized the quantitative statistical tool of Event History Analysis (EHA) to analyze the data on criterion and predictor variables to test the hypotheses of the study.

The emergence of colleges and universities is a well-documented topic in the American higher education industry. In the United States, the history of colleges and universities begins with the emergence of the "Schools of the Reformation" (Altbach, Berdhal & Gumport, 2005 p.39) such as Harvard, Yale and College of William and Mary in the 1660s. The more recent history recorded the emergence of the Junior Colleges of the 1920s, when democratic access won over the social exclusiveness of earlier times (Altbach, Berdhal & Gumport, 2005). Scholars have concluded that the past emergence of various college and university forms (types) reflect the social ethos of the time and the political and economic environment of the country (Altbach, Gumport & Berdahl, 2005; Thelin, 2004; Vesey, 1965).

As in biological organisms and their survival in the environment each new organizational form has to fight for its survival and legitimacy (Hannan & Freeman, 1989). For example, the higher educational organizational expansion of the 1920s was not without controversy. Abraham Flexner, a fervent critic of this growth declared that "universities have become service stations for the general public" (Altbach et.al, 2005 p.58). Although there was a pause in the emergence of new forms of colleges and universities from 1930 to 1970 since 1975 student enrollments

grew exponentially and new forms of post-secondary organizations such as the for-profit colleges and universities emerged in the industry (NCES, 1980, 2012). Today, the four-year degree granting FPCUs represent 12 percent of the annual student enrollments and 25 percent of the college and university population (IPEDS, 2014). Yet, there is no explanation for the emergence of these newer forms of colleges and universities.

Instead most contemporary research on for-profit colleges aims to explain the market success of FPCUs rather than how they emerged in the country. Many scholars argue that profit motive, greed of corporations and proprietors are the leading reasons for FPCUs' market achievements (Breneman, Pusser & Turner, 2006; Kelly, 2001; Kinser, 2005, 2006; Morey, 2004; Tierney & Hentschke, 2007). There is ample evidence to support this argument. Education is the second largest industry in the country after healthcare, comprising more than seven percent of the Gross Domestic Product or GDP (US BEA, 2011). The postsecondary share of the GDP is approximately three percent (US BEA, 2011). Moreover, 70 percent of the revenues of colleges and universities originate from public sources. Geiger and Heller (2011) say that, "the corporations have been drawn to education not because they can build a better mousetrap or a better classroom, but in order to tap into this enormous reservoir of public funds" (p.14). Mettler (2014) went further and raised the question as to who is benefiting from this enormous public support of for-profit colleges? She concluded that it is the business person who owns the for-profit colleges or in the case of publicly traded for-profits it is their corporate investors.

Although compelling, these explanations are based on the case histories of a few large FPCU corporations such as the University of Phoenix or DeVry and their rise in the industry. What is lacking is a population level account, addressing nationwide trends, from an historical

and dynamic (evolving) standpoint. Theories of organizational foundings have successfully explained the birth and the legitimization of organizational forms in other industries such as the health care industry, the public school systems and the newspaper industry (Hannan & Freeman, 1977; Renzulli, 2005; Scott, Ruef, Mendel & Caronna, 2000). Despite the significant presence of FPCUs rigorous quantitative research with a strong disciplinary grounding, on basic dynamics that underlie the growth of these institutions at the national level remains limited.

Purpose of the Study

The purpose of this quantitative correlational study is to explain the relationship between the higher education industry and its environments and the emergence of a new organizational form, the For-Profit Colleges and Universities. This study collected and analyzed the event history data on FPCU births in 903 Core Based Statistical Areas (CBSAs) as defined by the Office of Management and Budget (OMB) and the environmental conditions in the CBSAs for a period of 38 years. The *unit of observation* is defined as the CBSA, a geographic entity consisting of at least one core with a minimum population of 10,000, plus adjacent counties having a high degree of social and economic integration with the core (OMB, 2010). The total number of CBSAs (917) represents 94 percent of the US population and 89 percent of the economic activity in the US (OMB, 2010).

The objective of this study is three fold. First of all, this study hopes to offer a theory based explanation for the emergence of FPCUs with the help of theories of neo-institutionalism (Arum, 1996, 2000; Meyer, 1977; Meyer & Rowan 1978; Meyer, Scott & Deal, 1983) and population ecology (Aldrich, 1999; Hannan & Freeman, 1997, 1989; Nielsen & Hannan, 1977; Scott, 1998; Carroll & Swaminathan, 2000; Carroll & Hannan, 1995). Secondly this study plans to offer a national level explanation for the emergence of FPCU form. Lastly, I conducted a

longitudinal study of FPCU births using archival data. The monitoring of CBSAs for FPCU birth (founding) commenced in the year 1975, a time before any regionally accredited FPCUs appeared in the nation. According to *estimated year of establishment records* in IPEDS (1980 & 1984), the very first FPCU emerged in the year 1976 in Cambridge, MA. I tracked FPCU birth records in the IPEDS and its predecessor Higher Education General Information Survey (HEGIS) from the year 1975 to the year 2012, the 38 years of observations makes this a longitudinal study.

Problem Statement

The For-Profit Colleges and Universities (FPCUs) are one of the most controversial forms of post-secondary institutions in the United States and perhaps across the world. Today, 25 percent of all degree granting institutions in the country are identified as FPCUs (IPEDS 2014). Yet, we do not know much about these institutions or how and why they came into existence. The limited scholarly research on FPCUs is focused on explaining their competitive position in the industry and their misbehaviors (Berg, 2005; Breneman, Pusser & Turner, 2006; Coleman & Vedder, 2008; Kelly, 2001; Morey, 2001; Ruch 2001). Moreover, leading academic researchers such as Kinser (2006) and others (Berg, 2005; Ruch, 2001; Tierney & Hentschke, 2007) are of the opinion that much of the published literature on for-profit colleges is self-serving and therefore it does not engender an objective discussion on the origins of FPCUs. Hence there is a gap in the research literature on how and why FPCUs emerged in the higher education industry since 1975.

Furthermore, most if not, all of the research on FPCUs so far has been normative and topic based, trying to explain for-profits' market success in the environment but not their origins. Economic theories and principles of strategic management are adequate to explain the market

achievements of organizations, (Breneman, Pusser & Turner, 2006; Coleman & Vedder, 2008) but are inadequate in crafting an explanation for the origins of FPCUs as the "third sector" in the higher education industry, the other two being the public sector and the non-profit private sector (Kinser, 2006).

Additionally, these market success arguments imply a level of apathy on the part of incumbent public and non-profit private colleges and universities (Berg 2005; Morey, 2002; Ruch, 2001). A cursory examination of incumbents' performance from 1975-2012 will show their exponential growth in student enrollments and programs. The idea that FPCUs are a disruptive innovation is noteworthy (Tierney & Hentschke, 2007). The theory of disruptive innovation has been instrumental in explaining macro level changes in many industries (Schumpeter, 1939, 1950).

When it comes to understanding the emergence of a particular type of organization in an industry, organizational theories have been helpful. I will discuss these theories in detail later in the theoretical framework section. For example, neo-intuitionalism and population ecology have helped explain the environmental context and the processes that led to the emergence of new forms of organizations in industries such as the public school systems (Renzulli, 2005), health care industry (Scott, Ruef, Mendel & Caronna, 2000) and beer and wine production industries (Carroll & Swaminathan, 1992; Swaminathan, 1995).

Neo-institutionalism helped explain the influence of the socio-political environments such as the federal and state laws, the regulations of professional association and the deep-seated practices in these industries. Population ecology and its sub-theories helped to explain the influence of external environments, such as the economic, the demographic, the labor markets and the competitive environments as well. Similarly, these theories could help explain the

influence of environmental and organizational factors, and the emergence of FPCUs in higher education industry. Thus we may understand the origins of FPCUs as an organizational form in higher education.

Research Question

The research question directing this inquiry is, what predicts or explains the odds of four-year or above degree granting For-Profit Colleges and Universities (FPCU) foundings in the US since the year 1975? This study employed Event History Analysis (EHA), a quantitative correlational method for the study of this social phenomenon. EHA helped to compile and analyze the birth history of regionally accredited degree granting for-profit colleges and universities from the year 1975 to 2012.

Specific questions.

- Does the level of population density in a geographic location explain the odds of FPCU births in that location?
- Does the level of economic integration as urbanization in a geographic location explain the odds of FPCU births in that location?
- Does the level of educational attainment among the adult population of a geographic location explain the odds of FPCU birth in that location?
- Does the level of unemployment rates in a location explain the odds of FPCU birth in that location?
- Does the level of service industry employment in a geographic location explain the odds of FPCU birth in that location?

- Does the level of competition in a geographic location represented by the number of incumbent providers of four-year or above degree education explain the odds of FPCU birth in that location?
- Does the level of exposure to socio-political changes such as new laws or regulations in a location explain the odds of FPCU births in that location?
- Does the presence of prior founding in a location explain the odds of founding in its adjoining neighbor?

Overview of Methodology

The purpose of this quantiative correlational study is to estimate the likelihood of FPCU emergence in a geographic location using large scale longitudinal data collected from various annually published reports of federal agencies. Empirical studies utilizing organizational founding theories typically rely on event history models, in which the outcome measure is *time to event*. Event history analysis (survival analysis in biostatistics) is designed for longitudinal data on the occurrence of events. Allison (2010) defines *an event as a qualitative change that can be situated in time,* such as the founding of a college or university. This study used retrospective or historical data on the criterion variable (FPCU foundings) and the predictors (various environmental factors) from annual reports of the National Center for Education Statistics, the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the US Census Bureau from 1975 to 2012.

Theoretical Framework

As mentioned earlier**,** this study explains the birth of FPCUs with the help of two interrelated organizational founding theories of neo-institutionalism and population ecology. Research on the emergence of organizations has shown that a perceived need for change may be

an impetus for innovation and may even help mobilize resources, but this need for change alone is not sufficient or even necessary for a change to occur (Arum 1996, 2000; Brint & Karabel, 1989; Meyer 1977; Meyer & Rowan, 1978; Meyer, Scott & Deal, 1983; Meyer, Tyack, Nagel & Gordon, 1979). Nielsen and Hannan (1977) stated it as, "we are unwilling to presume that any social system obtains any outcome it needs, in this case, increased schooling—simply by virtue of needing it. Schooling is an organized activity and the expansion of schooling represents an organizational achievement" (p.480). Therefore, if demand for higher education is not enough to cause change in the organizational environment of higher education, how, then, can the emergence and diffusion of For-Profit Colleges and Universities be explained?

Neo-institutional theories have helped to shift the focus from need-based arguments to sociopolitical environments (Arum, 1996, 2000; Meyer, 1977; Meyer & Rowan, 1978; Meyer, Scott & Deal, 1983). Other organizational scholars such as Hannan and Freeman (1987) have suggested that the organizational landscape itself plays a fundamental role in organizational population changes (Aldrich, 1999; Nielsen & Hannan, 1977; Scott, 1998). In spite of this insight on the interplay of sociopolitical and organizational environments influencing the emergence of new organizational forms in other fields, no published analyses have empirically assessed its significance in the higher education industry in the United States, specifically in regard to the proliferation of for-profit colleges and universities.

Furthermore, the long term ability of a society to cope with the changes in the environment depends on the development of new organizational forms and populations, and its ability to replace old ones (Hannan & Carroll, 2000; Hannan & Freeman 1986, 1989; Hannan & Nielsen, 1977). Hannan and Freeman (1977) say this population-level change is slow, characterized by long periods of stability, followed by shorter ripples of revolution. Research on

public schools and community colleges has shown that the organizational environment affects the formation of educational organizations (Brint & Karabel, 1989; Meyer & Hannan, 1979; Meyer, Rubinson, et al. 1977; Meyer, Tyack, et al, 1979).

Research Design

Within the class of event history models, the estimation strategy most appropriate for this study is the longitudinal, proportional hazards Cox regression, for two reasons. First, this model does not impose any assumptions about the distributional nature of the outcome measure, which in our case is the *time to birth (founding)* of FCPUs in a given location. Second, it is efficient with repeated measures data involving consecutive births in a given location over time (Allison 2003, 2005). Each FPCU birth or founding in a CBSA constitutes an *event*, and time to event is specified as the number of years to the event from 1975. The dataset includes 34,314 CBSA-by-year observations (903 CBSAs over 38 years, 1975 to 2012). Cox regression simply estimates effects on the risk or "hazard" of event.

Hypotheses

- *Hypothesis 1*: Geographic forces such as the residential population and urbanization level, which are expected to have a positive relationship with FPCU founding because most FPCUs are located in large metro areas with complex highway and/or metro-rail systems that facilitate commuting to after-work classes (Office of Management and Budget 2010);
- *Hypothesis 2:* Labor market conditions, such as the availability of high school diploma holders who are "working adults, minorities, under-prepared students, "stop-outs" and dropouts with unsuccessful college experiences, and parents with family responsibilities"

(Kelly, 2001 p.6) which FPCUs tend to attract (Levine 1997; Morey 2004), are expected to have a positive relationship with FPCU foundings.

- *Hypothesis 3*: Economic factors such as job growth in mid-level and high-level service industries (e.g., finance, management, education, healthcare, accounting, marketing), which are expected to have a positive relationship with the founding of FPCUs because most FPCUs' offer degrees targeted for such industries (Autor, Levy and Murnane 2002)
- *Hypothesis 4*: The density of public and non-profit private colleges and universities are expected to be positively related to FPCU founding because FPCUs are likely to appeal to adults without college degrees who are well past college age to go back to traditional colleges (Kelly, 2001; Levine1997; Morey, 2004).
- *Hypothesis 5*: The greater the number of existing FPCUs, the more likely the founding of new ones.
- *Hypothesis 6:* The earlier the CBSA comes under the preview of a regional accrediting agency open for FPCU accreditation, the faster the diffusion of FPCUs in that CBSA.
- *Hypothesis 7:* The spread or diffusion among adjacent CBSAs within a combined statistical area (CSA) is expected to be contagious because contiguous CBSAs may imitate each other in founding FPCUs.
- *Hypothesis 8:* The diffusion of FPCUs will occur faster in earlier years of the 1975-2012 period and slower in later years.

Significance of the Study

As an empirical study on the origins of FPCUs, this study seeks to explain the phenomena of FPCU emergence using national level longitudinal data from the very first founding in 1976 to foundings in 2012. To date there are no large scale quantitative studies of

FPCU emergence and diffusion in the existing literature. Most studies have a limited empirical scope, and given the lack of a comprehensive theoretical grounding, prevailing insights are fragmented. As an important first step in resolving these problems, this study employed neoinstitutional theory and population ecology theory to the examination of FPCU emergence and diffusion; and, it relied on a uniquely large dataset involving a wide array of predictors. This study's intent is to initiate a theory based discussion on the emergence of FPCUs, a controversial form of colleges and universities that arose in the US higher education envionment since 1975 For that purpose, it tested the influence of diverse envionmental factors to predict the odds of FPCU birth in a location, such as the geographical traits, the econoimc envionment, the regulatory envionment, the labor market conditions and the role of incumbent providers in a location.

Prior studies on FPCUs cited profit motive, corporate culture, strategic mangement, the market demand and supply of college education services and the failure of incumbent service providers as the rationale for FPCU growth (Breneman, Pusser & Turner, 2006; Harkin, 2012; Kinser, 2005, 2006; Kelly, 2001; Morey, 2004; Ruch 2001; Tierney & Hentschke, 2007). Although these reasons help to explain the growth of for-profit institutions, they do not explain the context and the process of FPCU origins in the US. Thus, this study hopes to fill that gap in FPCU reaserch literature.

Evolution of new biological forms or new organizational forms can be known only after the fact, when differences in forms are clearly identified (Darwin, 1876). Kinser (2006) and other researchers (Kinser & Flory, 2006; Morey, 2004; Tierney & Hentschke, 2004) have clearly identified FPCUs as a variation in the colleges and university community, and they say that FPCUs represent 25 percent of the college and university population today. This study hopes to

expand on their findings by using a national level longitunal data to explain the envionmental factors that supported the birth of this organizational form in the US higher education industry since 1975.

Research on for-profit colleges is less than 15 years old and very little empirical work has been done in this segement (Kinser, 2006). By doing a national level, longitudinal study of most, if not, all of the FPCU foundings in the environment since 1975, this study hopes to initiate a evidence based discussion on FPCU origins. Thus significance rests not only in the application of organizational birth theories, but also in the use of quantitative descriptive methods in collecting and analysing the data.

This study hopes to contribute to the discussions on the role of for-profit colleges and universities in higher education industry today by offerings insights into the sociopolitical envionemnts and higher education industry conditions that influnced their emergence since 1975. The study results aim to support public policy and institutional policy development by providing observed evidence on the origins of FPCUs as a third sector in the post-secondary resource envionment.

Limitations of the Study

This study is limited to testing the influence of a finite number of environmental factors in higher education industry. Among the external environmental factors, this study tested influences of urbanization, service industry employment, and labor market environments. The institutional influences tested includes, competition, self-generating diffusion and the influence of the regulatory environments. There are many other factors that could be tested as well, such as the influence of neo-liberalism, economic restructuring, and higher education as a public good.

Although the for-profit sector includes a vast array of post-secondary institutions, this study is limited to institutions that are identified as four year or above degree granting institutions deemed as a for-profit entity by US tax codes, holding a valid accreditation from one of the six regional accrediting agencies. Additionally, this study is limited to institutions that have an on-the-ground presence and are assigned a unit id in the Integrated Post-Secondary Data System (IPEDS). Birth definition is limited to counting the physical presence of a FPCU in a CBSA and in the IPEDS's as a title IV eligible four-year or above degree granting institution accredited by one of the six regional accrediting agencies. Additionally, institutions such as DeVry or Strayer may be accredited as a regional institution with branch campuses by the accreditors, but this study counted the birth (appearance) of DeVry or Strayer in a CBSA as one birth regardless of the number of locations they may have in a CBSA. The Internet based on-line only FPCUs that have emerged in the environment since 1975 are not included in this study. The birth data gathered on FPCUs for this study is limited to pre-existing reports in the NCES IPEDS and its predecessor HEGIS.

This study is also limited to the data presented in the institutional characteristics file, reported either as the estimated year of establishment or the very first year the institution was reported in IPEDS as a four-year or above degree granting FPCU. Moreover, this study relies on pre-existing self-reported data in the IPEDS on institutional characteristics of public, non-profit private and for-profit private colleges and universities collected for title IV compliance purposes. Other predictor data on geographic classifications, demographic trends, economic trends and the levels of educational attainments also are limited to pre-existing reports from the US Office of Management and Budget (OMB), the US Bureau of Economic Analysis and the US Census Bureau. Finally, this study is limited to explaining the births of FPCUs that entered the higher

education industry since 1975. The data gathering was terminated by year 2012 because of data availability in IPEDS.

Dissertation Outline

Chapter two will explore more into the current literature on present day FPCUs, its role in higher education industry today and contemporary explanations for its emergence and diffusion in the environment. Chapter three will describe the data collection and the statistical procedures employed to collect and analyze the data. Chapter four will provide descriptive statistics for the variables and detailed results of the Cox Regression models as it relates to the research questions and hypotheses. Finally, Chapter five provides a summary of the findings and discusses implications for policy and practice as well as future research.

Chapter 2

Literature Review

Introduction

This study aims to offer a research based systematic explanation for the emergence of degree granting for-profit colleges and universities (FPCUs) that came into existence in the United States (US) since the 1970s. According to the Integrated Postsecondary Education Data System (IPEDS), there are currently about 740 FPCUs (2014). These institutions serve nearly 1.5 million students or about 12 percent of the higher education population (Bidwell 2015). Despite the significant presence of FPCUs, rigorous quantitative research with a strong disciplinary grounding on basic dynamics that underlie the growth of these institutions at the national level is limited. Many observers have pointed out this shortage in FPCU literature and the associated lack of empirical work (e.g., Berg, 2005; Kinser and Levy, 2005; Lechuga, Tierney & Hentschke, 2003; Ruch, 2001). Much of the recent literature on FPCUs is dominated by ideas and insights provided by journalists and "insiders" or actors associated with FPCUs (Lechuga, Tierney & Hentschke, 2003). Many books on for-profit colleges and universities could be described either as indictments of the for-profits or inside accounts of a handful of highly visible institutions (e.g., Berg, 2005; Ruch, 2001). The resulting discussions are in the form of polarized debates for and against FPCUs.

Altogether this body of work provides fragmented insights and they lack a coherent and comprehensive theoretical foundation. It also suffers from a limited empirical scope. Other than a few detailed historical accounts of the development of for-profit sector as a whole (e.g., Kinser 2006), most accounts address the differences and similarities of FPCUs from traditional colleges and universities and offer in-depth comparative case studies addressing distinct features of

leading FPCUs, such as the University of Phoenix and DeVry (e.g., Berg 2005; Brenner, Pusser, & Turner 2006; Morey 2004). Along these lines, there are scholars who examined the internal structures, processes, and the cultural attributes of FPCUs (Coleman & Vedder 2008; Ruch 2001; Soley 1998). And finally, there are a host of studies on how the innovation motive (Tierney & Hentschke 2007), the efficiency motive (Geiger & Heller 2011; Winston 1999b), and skills in business strategy (Breneman, Pusser & Turner 2006; Pusser & Doane 2001) have driven the success of FPCUs.

Despite the diversity of available insights, existing scholarship on FPCUs does not constitute a "mature literature" in which various explanations for FPCU success are simultaneously tested for relative strength, validity and relevance. The central problem in this sense is the absence of an overarching theoretical perspectives that allow consideration and testing of multiple insights that comprise the available repertoire and that set the stage for proposing a number of other, previously unaddressed insights. This study takes an important first step in remedying the problem. It draws on two key theories of organizational emergence and diffusion that not only encompass several existing insights on FPCUs, but also provide a number of other important ideas relevant for the study of FPCU development. These theories are neo-institutionalism—which addresses pressures for convergence and homogeneity in organizational fields—and population ecology, which emphasizes processes of divergence and heterogeneity.

Neo-institutionalism is relevant because it explains how new organizational forms stabilize and become taken-for-granted or legitimized in the environment (Meyer 1977; Meyer & Rowan 1978; Meyer, Scott & Deal 1983). Moreover, institutional theories argue that new organizations achieve legitimacy by adopting rules, norms and routines to become similar in shape or isomorphic as the incumbents in the environment (DiMaggio & Powell 1983; Scott,

2014). Hence, neo-institutionalism addresses the role of regulatory effects and self-generating diffusion effects within and across locations.

The theory of population ecology is relevant because it suggests that the variation of organizational forms in their structure, goals and strategy is a function of ecological processes, similar to variation, selection and retention in the biological environment. These processes result in the elaboration of organizational genetics as in the biological field (Hannan & Freeman, 1977, 1989). Population ecology theory also suggests that organizational forms occupy distinctive niches and they exploit particular combinations of resources as innovators and reproducers in the environment. Therefore, the evolution of organizational forms can best be studied by examining the environmental conditions that influence the rates at which *new* organizations are created, (Hannan & Freeman,1989).

A central concept of population ecology is organizational community, defined as a set of interrelated organizational populations. Population ecology theory argues that if existing organizations are stable, in both their forms and their relationships to one another in an organizational community, they will tend not to exploit any new resources that may become available in the environment at large. Thus new resource spaces open up and a fundamental "branching" occurs in the environment (Hannan, 1986). Consequently, new organizational forms will arise to exploit the resources. This is referred to as resource partitioning (Romanelli, 1989). It suggests that evolution of a new organizational form can be investigated by examining the relationship among various forms in a community and the resource dynamics within the community where the new form has emerged.

Together neo-institutionalism and population ecology theories address fundamental forces affecting the emergence and diffusion of all organizational forms. Their generalizable

insights are therefore highly relevant for coherence and comprehensiveness in the study of FPCUs. As I will demonstrate, these two theories also set the stage for a robust empirical strategy to test the relative influence of multiple factors, by means of multivariate analyses.

The Context of FPCU Emergence

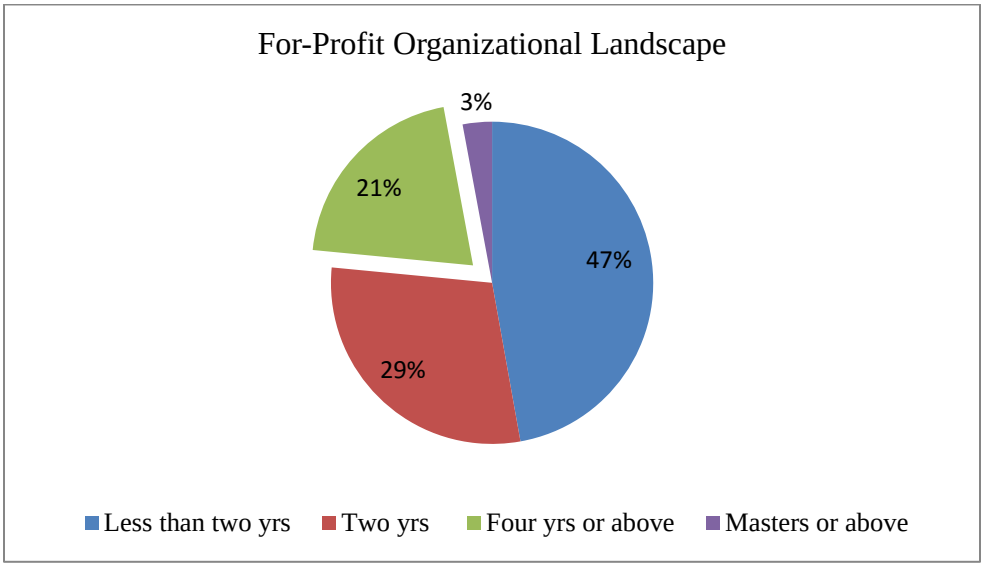
The historical, the regulatory and the institutional environment of higher education industry are relevant to the examination of the rationale for FPCU emergence. The following sections aim to develop the context of this inquiry by reviewing published literature on for-profit and degree granting higher education sectors. The organizational mix and the organizational dynamics of the degree granting sector constitute the institutional context. The student enrollment trends are indicative of the customer environments. Finally, organizational diversity within the FPCU community represents the adoption dynamics and the diffusion effects of this form in the higher education environment.

Historical context. The published history of for-profit higher education in the United States is organized around themes such as scandals and reforms (Honick, 1995), socioeconomic dynamics (Beaver, 2009; Breneman, Pusser & Turner, 2006), oversight and regulation (Chaloux, 1985), for-profits and political lobbying (Mettler, 2014) and the role of publicly traded corporations (Ruch, 2001). Kinser (2006) compiled many of these disparate strands of history on for-profit and proprietary post-secondary institutions starting from the 15th century to the 21st century. Kinser identified six historical stages in for-profit postsecondary evolution. Among them the *federal student aid era (1944-1994),* when for-profit schools were allowed to participate in federal student aid programs through new regulations and *the wall street era (1994-Present),* when the for-profit landscape was dominated by publicly traded corporations, constitute the historical backdrop of FPCU emergence. Why such a diverse array of for-profit

institutions? Kinser argues, education is a basic human need and educational providers come into existence as needs arise and they go extinct or transform as the societal need for educational services change. Furthermore, this cycle of birth and death and re-birth of for-profit higher education are not a well understood organizational phenomena (Kinser, 2006). A starting point to investigate a phenomenon such as the birth and the death of an organizational form is to examine the milieu in which they emerged. The following review constitutes such an effort.

Institutional context. In order to trace the evolution of a new organizational form, it is important to understand the community in which the new form is embedded (Astley, 1985; Hannan & Freeman, 1997 & 1989; Hannan & Nielsen, 1977). As figure-1 shows, the organizational community of for-profit higher education is diverse and the degree granting FPCUs are one of the organizational forms within the for-profit industry. The annual IPEDS survey of institutions shows 3,470 title IV eligible for-profit postsecondary institutions in the US. Among them, 47 percent (1,640) were institutions that offered only diplomas and certificates, another 29 percent (1,020) were two-year institutions and 23 percent (816) were four year or above institutions. Among the four-year or above institutions 96 (3%) were masters or above only institutions (IPEDS, 2012)

Figure 1. Organizational Community of For-Profit Higher Education



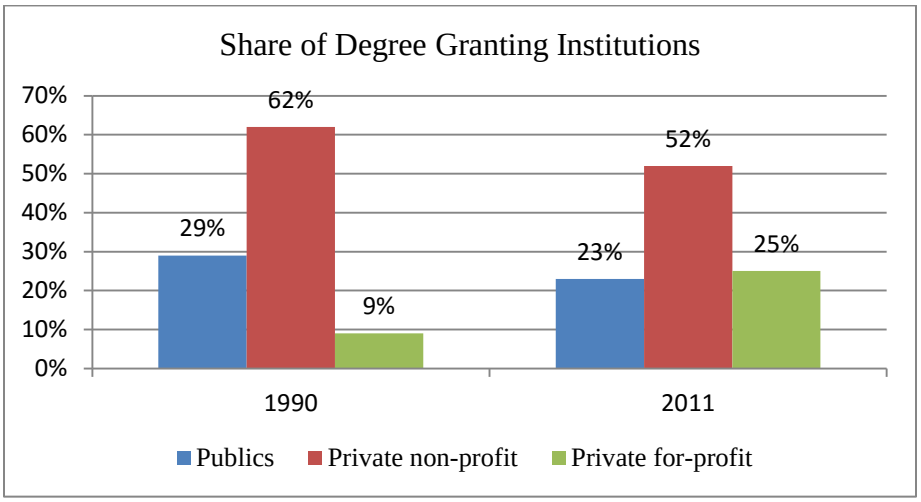
Source: NCES, IPEDS, 2012 survey of institutional characteristics.

As figure-1 shows, four-year or above FPCUs represent only 21 percent of the for-profit postsecondary organizational community. The term For-Profit Colleges and University (FPCU) has only recently been used and the term "FPCUs" is a suitable definition that places them along with the public and the non-profit private colleges and universities commonly referred to as Traditional Colleges and Universities (TCUs) (Tierney & Hentschke, 2006). Additionally, these FPCUs are accredited by one of the six regional accrediting agencies[3] like the TCUs. Therefore, programmatically speaking, FPCUs are part of the regionally accredited four year and above degree granting universe as well, which has been historically a non-profit sector. Thus this definitional distinction as "regionally accredited FPCUs" is crucial in explaining the unique dual citizenship status of FPCUs in the higher education organizational community. The following paragraphs will further demonstrate this point.

[3] MSA (Middle States Association of Colleges and Schools), NEASC (New England Association of Schools and Colleges) NCA (North Central Association of Colleges and Schools), NAC (Northwest Accreditation Commission), SACS (Southern Association of Colleges and Schools), WASC (Western Association of Schools and Colleges

A review of the institutional position of FPCUs in the degree granting segment will illustrate their unique position. FPCUs became a significant provider of degree granting college education in the last few decades. In 1976 there was only one FPCU in the country enrolling less than 50 students. Thirty-seven years later, in 2011, there were 738 FPCUs enrolling about 1.5 million degree seeking students (IPEDS).

Figure 1. Changes in the Degree Granting Institutional Landscape



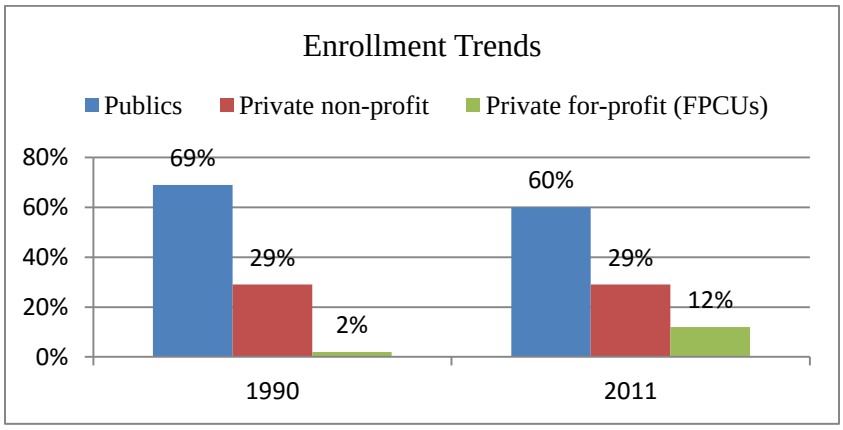
Source: NCES, IPDES, Survey of student enrollment in degree granting institution: 1990-2011

Furthermore, in 1990, among the total number of 2,226 degree granting institutions, 655 (29%) were publics, 1,379 (62%) were private non-profits and 192 (9%) were for-profits. Twenty years later, in the fall of 2011, among the 2,982 institutions that enrolled degree seeking students, 679 (23%) were publics, 1565 were private non-profits (52%) and 738 (25%) were for-profits (IPEDS, 1990-2011). Thus, FPCUs' dual membership is evidenced; they represent 21 percent of the for-profit sector and 25 percent of the degree granting sector, which was historically a non-profit (501c3[4]) sector. Not only the institutional share but also the student enrollment trends determine the relative position of colleges and universities in the higher education industry.

[4] An IRS designation for organizations that are exempted from paying taxes

Enrollment trends. A closer look at the enrollment trends in the degree granting sector will illuminate the role of FPCUs in this sector. In 1990, sixty-nine percent of the students enrolled in the public institutions, 29 percent in the non-profit privates and only two percent of the students enrolled in the for-profit colleges

Figure 3. Enrollment Trends in the Degree Granting Sector



Source: NCES, IPDES, Survey of Student Enrollment in degree granting institution: 1990-2011

By the end of the first decade of the 21st century, 60 percent of the students enrolled in the public institutions and 29 percent in the non-profit private institutions and 12 percent in the FPCUs. Hence it is evident that FPCUs are embedded in the traditional degree granting community while holding the status as a for-profit[5] entity (IPEDS, 1990-2011; Kelly, 2001; Tierney & Hentschke, 2007).

Emergent FPCU diversity. As mentioned earlier, for-profits are a diverse community of organizations. Similarly, the universe of FPCUs is diverse as well. The Education Commission of the States (ECS) assessed the sector level dynamics of for-profits and published a report titled *Meeting the needs and making profits (*Kelly, 2001). This report was based on extensive interviews of over 80 individuals on 13 campuses and central offices of five corporate

[5] For-profit status determined by Internal Revenue Services, which categorized FPCUs as a business entity. Hence FPCUs pay taxes on its margins while TCUs categorized as 501c3s are exempted from taxes.

institutions. The report divided for-profit institutions into three types: the enterprise colleges, which consisted of small local institutions, the super systems, which enrolled thousands of students on numerous campuses located throughout the country and Internet-based institutions that used technology to deliver their educational programs. Kinser (2006) adopted this paradigm and called for-profits "the third sector" of degree granting industry, publics and non-profit privates being the other two sectors. This institutional diversity is often ignored in the present day literature on FPCUs. Most, if not all, of the FPCU research so far has been focused on a handful of highly visible, super systems such as the University of Phoenix, DeVry or Strayer.

In sum, for the last four decades FPCUs have been a significant part of the higher education industry, especially in the prestigious four-year degree grating sector. Two themes emerging from this background review are the institutional environment of the industry and the organizational dynamics of higher education. Although, there could be a link between the institutional environment and the emergence of new organizational forms, no studies so far have explained it as such. Thus, there is no sector-level explanation for the emergence and diffusion of FPCU as an organizational form in the higher education industry yet. Organizational theories were instrumental in examining phenomena such as birth and diffusion of organizational forms in other industry sectors. The next section will describe the theoretical foundations of this study.

Theoretical Underpinnings

Recently, scholars have been pointing out the need to ask the same basic questions of the for-profit sector as were asked of the traditional not-for-profit private and public institutions (Kinser, 2006; Berg, 2005; Tierney & Hentschke, 2007). I argue in this study that a theory-based explanation for the emergence of FPCU form is critical in understanding the changes in higher education industry. Two theories identified to help explain the emergence of FPCUs are neo-

institutionalism and population ecology. The former is a convergence perspective which argues that, organizations emerge and survive in the environment because they become more like other organizations in the environment by adopting prevailing beliefs, norms and practices in the environment. The latter is a divergence perspective which argues that new forms emerge and survive through a process of variation, selection and retention, similar to the survival process of organisms in the biological environment. Prior to engaging in the review of present day FPCU literature in light of organizational theories, the concept *of institution* and *organization* must be addressed in moderate detail for the sake of clarity.

Organization/institutions. The organization/institution delineation is a tenuous one at best. Disciplines such as institutional economics, political science, and sociology have their own interpretations. For example, institutional economists see the distinction as one that stems from the basic difference between ends and means. For them the term *organization* denotes the agent as pursing ends—irrespective of whether the ends are objective purposes. The term *institution* is about the means needed to pursue the ends—irrespective of whether the institutions are about efficiency. Interestingly, the "means includes, besides material and technological resources, paradigms and conventions or, in short, institutions" (Khalil, 1995, p.447).

This study adopts the descriptions highlighted by Jepperson (1991). He maintains that all other things being equal, institutions are socially constructed, routine-reproduced, program or rule systems. "Institution represents a social order or pattern that reveals a particular reproduction process" (p.145) and institutionalization represents the process of attainment of such an order or pattern. Then he adds "institutionalization is best represented as a particular state or property of a social pattern" (p.149). Jepperson suggests institutionalization is relative to the context, such as at various the levels of the organization, dimensions of relationship or to the

centrality or the marginality of the institutional object. For example, the University of Kansas is an *institution* to the people of Kansas but it is less of an institution to the inhabitants of New York. Moreover, he posits, the patterns of reproduction generate reciprocal expectations similar to "taken for grantedness" (legitimacy) in some fashion. For example, a public university may be more of an institution than a FPCU because it has more legitimacy in the environment; it has been taken for granted for decades or in some cases for centuries.

Meyer and Rowan (1977) suggests, as rationalized institutional rules arise in a given domain of work activity, formal organizations form and expand by incorporating these rules as structural elements. Thus organizations are a manifestation of rationalized institutional myths. Understandably, public discourse often conflates these terms and uses them inter-changeably. For example, the IPEDS's use the term *institution* to describe specific colleges and universities[6] including for-profit colleges, although colleges and universities are described as higher education in other contexts. In this study the use of the term organization or institution when referring to college/university form is a general one, which cuts across the difference between these two rationalities. In what follows, I will analyze contemporary FPCU literature in light of the theories employed in this study, beginning with neo-institutionalism.

Neo-institutionalism

I will begin with the convergence lens of neo-institutionalism which tries to answer the question of homogeneity in organizational forms and practices. Neoinstitutional theory addresses how new organizational forms develop, spread, and become legitimated in one sphere of activity after another. Neo-institutionalism also explains how and why organizational fields such as biotechnology or education, are composed of organizations that look more alike than they differ. In trying to explain institutional isomorphism, McFarland and Gomez (2013)

[6] NCES IPEDS refers to colleges and universities as institutions in its reports.

recounts, how the poor sub-Saharan villages with classes taught outside in ground indentations in place of chairs and tables; how the religious fundamentalist schools in Saudi Arabia where boys and girls were taught separately; and even wealthy western schools with computer tablets in every hand, all had enough similarities that one knew right away what kind of organization it was, they were all school classrooms. The diverse social and cultural settings verify widely held beliefs on what constitute schooling. Scott (2003) argues that these beliefs and conceptions are cultural-cognitive controls, or deep social structures in the environment. They are practiced in several forms, as regulative, normative and cultural cognitive controls. At the empirical level, neo-institutionalism aids us in gauging the influence of these various forms of institutional controls— on the homogenization and spread of new institutional forms such as the FPCUs. In the next section I will examine the regulatory environments of colleges and universities in light of Neoinstitutionalism.

Regulatory environments. DiMaggio and Powell (1983) contend that bureaucratization and other kinds of homogenization are effected largely by the state and the professions, "which they called the great rationalizers of the second half of the twentieth century" (p.147). An explicit form of state level control is practiced through regulations or regulatory institutions. Regulatory institutions constrain behavior through rules or laws and behavioral inducements like incentives and punishments. Scott (2014) characterized these laws, rules, norms and practices as beliefs that support the development of new organizational forms.

For the past two centuries, the federal government's legislative actions in the US higher education industry resulted in the emergence, growth and transformation of various forms of colleges and universities. It began with the Morrill Act of 1862, which led to the emergence of land-grant institutions (Veysey, 1965). Then the Truman Commission report of 1947 helped the

proliferation of community colleges during the 20th century (Brint & Karabel, 1989). The growth in postsecondary enrollments since the 1950s was the result of the GI Bill of 1944 (Kinser, 2002; Geiger & Heller, 2011). The cold war elaboration of nonprofit research universities (Calhoun & Rhoten, 2011: Geiger, 1986) and the increasing provision of financial aid through higher education act (HEA) of 1972 and its re-authorizations (Slaughter & Rhodes, 2003; Tierney & Hentschke, 2008) are all notable regulatory developments that impacted changes in the higher education industry. These were regulatory events in American higher education that often precipitated the emergence of new institutional forms, their growth and transformation.

North (1990), an institutional economist, views regulatory environment as the primary foundation for organizational legitimacy and survival. Empirical indicators of regulatory institutionalism are evidenced as expansion of constitutions, laws, codes, rules, regulations, directives and formal structures of control. North (1990) argues that in the market-based sector, the regulatory process may be in the form of incentives while in the public sector the process may be one of sanctions. The following paragraphs on regulatory changes in higher education environments, will weigh the relevance of these assertions.

Lee and Merisotis (1990), Morey (2004) and Mettler (2014) concluded that the emergence of present day for-profits such as the University of phoenix (UOP) and DeVry have their roots in the federal student aid legislations of 1944 (GI Bill). The GI Bill commenced a switch in the relationship between the federal resources and for-profit institutions (Morey, 2004). Although, the first drafts of the GI bill did not include for-profits, later they were added to improve student choices. Other researchers Clowes (1995), Hawthorne (1995) and Honick (1995) argue that in the 1970s and in the 1980s, proprietary schools lobbied for and became

eligible to receive state and federal student financial aid. When the for-profit colleges received significant federal subsidies through student financial aid, they became indirectly subsidized by the federal government like other sectors of higher education such as the public and the non-profit private sectors.

Other scholars have described the development of this coercive regulation more explicitly. Slaughter and Rhodes (2003) Kinser, (2006) and Tierney & Hentschke (2007) state that the adjustments to the Higher Education Act of 1965 brought down the barriers of entry for the for-profit sector into federal funding mechanism. It says "no institutional sector will be guaranteed priority under the law; institutions will only be provided with the ability to compete on an equal basis for federal funding" (US House of Representatives, 2004, p.5). This assertion placed the public, the non-profit and the for-profit institutions on the same resource gradient, and it deemed that the inter-organizational competition for students should determine who receives federal funds for student financial aid (Tierney & Hentschke, 2007).

These declarations display the force of regulatory institutions and the resulting coercive isomorphism among colleges and universities. The process is analogous to neo-institutional reasoning, which argues; organizations survive and succeed in their surrounding environment by achieving a social and cultural fit with the environment through regulatory compliance (Meyer & Rowan, 1977). Therefore, implicit in these arguments are the idea of the coercive force of regulatory institutionalism generating isomorphic organizations and rational legitimacy for the new form.

Furthermore, we see the coercive power of HEA of 1965 and its subsequent reauthorizations, which were linked with real risks and rewards. The comprehensive federal criteria for higher education funding, as cited earlier, is an important regulatory reform, since the

majority of the federal support for higher education come as student aid programs as outlined in the title IV rules (Geiger & Heller, 2011). Slaughter and Rhodes (2003) characterized this as a major shift, from institutional level financing to individual or student level financing. They argue that giving money directly to students rather than to the institutions turned students into customers. Therefore, this legislation inadvertently opened up the higher education for market-like competition. Thus the regulatory action of the federal government was instrumental in not only rationalizing for-profits, but also homogenizing the field.

The resulting isomorphic changes among FPCUs and traditional colleges and universities were confirmed by Brimah (2000) and Kelly (2001). Their primary research on FPCUs and their operations confirmed that FPCUs look less like proprietary schools and more like public and private non-profit colleges and universities. Similar homogenization resulting from conformity to rules and rituals of the wider institutions has supported the emergence and diffusion of new organizational forms in other industries. Renzulli (2005) suggests that the regulatory environments created by the state laws were the first step in the emergence of charter schools. Moreover, the political processes affected sociopolitical legitimacy by providing access to state resources as well. Thus this discussion on regulatory environments of higher education illustrates that regulatory changes in the industry formed the foundational environment for FPCU emergence (Kinser, 2006; Morey, 2004).

Normative environment. Based on the theories of early sociologists such as Durkheim, March and Olsen (1989) adopted the concept of normative legitimacy or the logic of appropriateness in organizational emergence and diffusion. Normative institutionalism includes both values and norms; values are the conception of the preferred along with the criterions by which behaviors can be assessed and compared and norms specify how things should be done.

Norms define goals as well as designate appropriate ways to pursue those goals (Scott, 2014). Moreover, normative legitimacy stresses the logic of "appropriateness" vs. the logic of "instrumentality" (p. 65). The emphasis is not just on getting a job done as in instrumentality, but to an enduring loyalty to the purpose behind doing the job in the first place (Selznick, 1957). Normative isomorphic organizational change stems primarily from professionalization. Two aspects of professionalization generate normative isomorphic changes. One is based in formal education produced by university specialists and the second is through the growth and elaboration of professional networks that span organizations, across which new forms diffuse rapidly (DiMaggio & Powell, 1983). The mechanism of compliance is through the conferment of a sense of honor or shame. Empirical indicators of normative institutions include accreditation and certification (Ruef & Scott, 1998; Scott, 2014). For example, colleges are deemed as prestigious when they are accredited by a regional accreditor. Conversely colleges are deemed as inferior if they are accredited by other agencies such as a national accreditor.

Stinchcombe (1997) emphasized the stabilizing influence of social beliefs and norms, enforced by accrediting agencies. Today in the field of degree granting college education, the most prestigious accreditation is offered through the regional accrediting agencies. There are *six regional accreditors* serving colleges and universities in six geographic regions of the United States and its territories. Historically, regional agencies accredited only non-profit and public colleges and universities (Kinser, 2006; Tierney & Hentschke, 2007). National accrediting agencies predominantly accredited the for-profit colleges and the vocational and the career or technical programs.

It is important to note how the normative controls are exercised through the logic of appropriateness. Every college has the right to set standards and refuse to accept transfer credits.

However, if a student has attended a school that is not regionally accredited, it may be impossible to have the credits transferred, or even the degree earned, recognized by a regionally accredited college (GAO, 2005). Regionally accredited institutions constitute majority of the colleges and universities in the degree granting field. This demonstrates not only the stabilizing influence normative controls, as Stinchcombe (1997) argues, but also the conferment of appropriateness and prestige by a professional agency such as the regional accreditor. Regional Accreditors are the purveyors of "the logic of appropriateness" in the operations of degree granting colleges and universities. They warranty that the course contents of subjects taught and the credit hour requirements for the degree credentialing. Moreover, they ensure that colleges follow proper patterns and procedures which are deemed as proper by the accreditor and other institutions in the region. In other words, accreditors are ensuring "if there is any algebra in the algebra course" (Stinchcombe (1997, p.18).

As Scott (2014) suggests regulatory and normative controls could be layered one inside another. The binding expectations of the state are combined with the normative expectations of the professions together to endow rewards and meet out punishments. As indicated earlier, regional accreditation is an essential requirement to hold the capacity to grant four-year degrees. But it is also a requirement to qualify for federal student financial aid, for students at the degree granting institutions (Coleman & Vedder, 2008; Tierney & Hentschke, 2007). Remarkably, regional accreditation was unavailable to for-profit colleges before the 1970s (Kinser, 2006). Together, these institutional controls allowed access to resources and helped to acquire legitimacy and limited prestige for FPCU students and credentials.

Ewell and Schild (2000) examined the process of regional accreditation of for-profit colleges by six regional accrediting agencies. They found out that the approaches used to

accredit for-profits are no different than that of the public and the non-profit institutions. Although, all six accreditors did not have separate standards for accrediting for-profit institutions, many applied their existing standards differently, especially the standards regarding governance and finance (Ewell & Schild, 2000), due to FPCU's dissimilar institutional control and for-profit status. "The accreditation agencies have become a significant player, in the for-profit sector and the impact of state and federal regulation in creating the environment where the sector now thrives is not often acknowledged" (p.11). Here we see the normative and the regulatory institutional controls working in tandem to explain the emergence of FPCUs.

Normative isomorphism arising from professionalization has been studied in the healthcare industry. Lee (1971) found out that, hospitals were interdependent organizations and certain inputs were acquired not necessarily to improve production efficiencies but to minimize status gap. Lee notes, the hospital administrators were less concerned with the efficient use of resources and more concerned with "status competition and parity in prestige" (p.51). Fennell (1980) also discovered that competition among hospitals was based on "attracting physicians, who, in turn, bring their patients to the hospital"(p. 505). Moreover, hospitals increased their range of services not because there was an actual need for a particular service or facility within the patient population, but because they will be defined as fit only if they can offer everything other hospitals in the area offered (Fennell, 1980). Thus normative isomorphic processes can be expected to continue in the absence of evidence that they increase organizational efficiency. Moreover, the pressures for competitive efficiency were mitigated in the hospital industry due to normative isomorphic pressures.

Cultural-cognitive environment. The cultural-cognitive theorists, another set of institutionalists, points out the power of templates for action (Scott, 2015; Shank & Abelson,

1977) and the importance of recurrent realization of these templates in institutional existence (Berger & Luckmann, 1967). DiMaggio and Powell (1984) called it "mimetic isomorphism resulting from standard responses to uncertainty" (p.150). Uncertainty is a powerful force that encourages imitation, when organizational technologies are poorly understood when goals are ambiguous, or when the environment creates symbolic uncertainty (March & Olsen, 1976).

US higher education is an excellent example of this type of organizational uncertainty. Winston (1999a) in his seminal work on the "awkward economics of higher education" analyzed the central characteristics of higher education. He described higher education as ''donative-commercial nonprofits[7]" engaged in "trust-markets". Managers in trust-markets such as higher education are motivated by ''prestige maximization" (James, 1990) not by "profit maximization" like business managers. The concept of prestige is only a perception among observers and it does not require evidenced based accountability, therefore the goals of college management and administration are ambiguous.

Winston (1999a) maintains that higher education's production technologies depend on peer effects generated by the student-customers. For instance, the quality of the incoming students determines the quality of the output of the colleges. As a donative-commercial non-profit, colleges may control the quality of input through selective admissions and by attracting high quality students through grants and scholarships. The larger the college's donative resources the greater the college's capacity for selectivity and therefore all colleges are not created equal. Moreover, the students who are the input in the production environment are simultaneously the college's customers and after graduation they are the product of the college as well. Thus Winston (1999a) demonstrates the complexities of higher education's organizational technology

[7] Higher education receives revenues from multiple sources including donative and public funds, which enable them to be selective of their input for production

and the potential for uncertainties. Ambiguities and uncertainties of this nature, along with asymmetries of information[8] on the quality and reliability of the services, create high level of ignorance among its users, leading to faith based college purchase decisions (Hansmann, 1980). In such an environment colleges may model themselves on other colleges resulting in mimetic isomorphism (DiMaggio & Powell, 1984).

Mimetic isomorphism implies not only isomorphic duplication, but also spread in time and space, referred to as temporal and spatial diffusion (Baum & Amburgey, 2000). Strang and Meyer (1993) construed the neo-institutional idea of institutional isomorphism as a structural condition that speed up diffusion. They viewed "diffusion as the homogenizing effects of coercive pressures from the state or dominant organizations within the field and the imitation among organizations unable to calculate individually optimal strategies and linkages to standardized and recalcitrant professions" (Strang & Meyer, 1993 p.491). DiMaggio and Powell (1983) and Strang and Soule (1998) viewed the homogenizing processes brought about by the coercive, mimetic, and normative sources offering as a conceptual mapping of the diffusion mechanisms. Morrill, Gail and Thrall (1988) explains, "diffusion is a spatial process that can transform the human and the physical space in which traits of the landscape change as a results of what happens elsewhere earlier" (p.6). One type of diffusion where the spread is smooth and the process is continuous is known as *contagion,* an idea taken from the field of epidemiology. Although the literature on FPCUs so far have not suggested a contagion type spread of this form, in the last 38 years, FPCUs have captured a significant share of the college and university market in terms institutions and enrollments, hence they diffused in the environment.

In the field of K-12 education, Renzulli and Roscigno (2005) found out that strong mimetic tendency existed among adjacent states in adopting charter school legislation and in

[8] The buyer do not have enough information to make informed purchase

creating charter schools. Their finding is consistent with Strand and Soule's (1998) argument that spatially proximate players influence one another by increasing their mutual awareness of an innovation. By virtue of their proximity, these players are likely to "infect" one another with new ideas. In the charter schools study Renzulli and Roscigno (2005) observed that the sharing of a border with a state or states that have already adopted charter school legislation increased the likelihood of that state in adopting such legislation itself. Moreover, the findings revealed that the number of charter schools in adjacent states significantly affected the adoption of charter school legislation.

Knoke (1982), using event-history analysis studied of the spread of municipal reforms and found out that the adoption of reforms came from some sort of contagious imitation effects, represented by the level of reform adoption in the neighboring cities. Although FPCUs emerged and diffused in the environment and today they constitute 25 percent of the organizational population in the industry, to-date, no one has addressed the relevance of this imitative replication. This study applied spatial and temporal concepts of diffusion and tested the contagious diffusional effects of FPCUs across 903 US geographies in the time span of four decades. The next section will probe the present day FPCU literature from the divergence perspective of population ecology.

Population Ecology Theory

The population ecology theory takes on the divergence perspective and it addresses why there are different kinds of organizational forms in a given sector. Population ecology also called organizational ecology is the study of rise and fall of organizational populations (Hannan & Freeman 1977& 1989). Population ecology helps to study how social conditions influence (a) the rates of creation of new organizational forms and new organizations, (b) the rates of demise

of organizational forms and organizations, and (c) the rates of change in organizational forms. "In its classical form, the principal tenet of organizational ecology can be stated succinctly as: once founded, organizations are subject to strong inertial pressures, and alterations in organizational populations are largely due to demographic processes of organizational foundings (births) and dissolutions (deaths)" (1989, p.162). Hannan and Freeman (1977) posit that the diversity of organizational forms in their structure, goals or strategy is a function of ecological processes of variation, selection and retention. These processes result in the elaboration of organizational genetics (Hannan and Freeman, 1989). So population ecology aims to explain how social, economic and political conditions affect the relative abundance and diversity of organizations. As it was important to explain the concepts of institutions/organizations while discussing neo-institutionalism, so also, it is relevant to discuss the concept of 'organization" in population ecology theory. As mentioned in the introduction, the idea of organizational community, defined as a set of interrelated organizations, sharing a resource space/niche, is central to the population ecology theory. Hence along with organizational community, related concepts of organizational form and organizational populations must be explained. Romanelli (1991) says "the concept of organizational form refers to those characteristics of an organization that identify it as a distinct entity and, at the same time, classify it as a member of a group of similar organizations" (p.82). An organizational population is defined as a group of firms with similar form, or dominant competencies (McKelvey, 1982; Romanelli, 1991; Stinchcombe, 1965).

A population of organization consists of all the organizations within a particular boundary that have a common form. In other words, the population is the form as it exists or is realized within a specified system. An organizational population emerges in an organizational

community of interrelated organizational populations, which constitutes the environment within which a new organizational form becomes established. Present focus of analysis is on the organizational population, not the individual firm. For instance, FPCUs emerged in the community of colleges and universities that constitute the degree granting organizational community and the emergent population of FPCUs is the focus of this study.

Organizational diversity. Although there are no studies explaining the emergence of FPCU as an organizational form from a theoretical perspective, Birnbaum (1983) accounted for the organizational diversity in US higher education environment using population ecology theory. He addressed the level of organizational diversity in the industry from 1960 to 1980, using data from NCES[9] survey of the post-secondary institutions. He used data from 1960 and 1980 surveys, as a snap shot of the beginning and the end of decades. Similarly, Morphew (2009) examined the level of institutional diversity in higher education industry from 1972 and 2002 using the same methodology. While, both Birnbaum and Morphew concluded that there were no significant changes in organizational diversity, from 1960 to 2002, they documented the diffusion of community colleges and the rise of public research universities. They also identified the demise of single gender colleges and teacher's colleges and the decline and transformation of religiously affiliated colleges. Birnbaum's study documented the birth, death and reemergence of proprietary schools from 1960 to 1980, but discounted them from diversity designs. Later in 2009, Morphew study noted the presence of for-profit colleges as degree granting institutional population but he discounted them from main-stream[10] diversity. This shows the position of for-profits on the fringes of academic research.

[9] National Center for Educational Statics
[10] Mainstream includes publicly funded institutions and privately funded non-profit institutions

Given the fringe position of FPCUs in academic research, there are few studies that took note of their persistence. These studies cite factors such as customer/student focus (Kelly, 2001; Levine, 1997; Morey, 2004), market demand for higher education and the corporate culture of FPCUs as leading reasons for FPCU expansion and success(Coleman & Vedder, 2008). Additionally, arguments such as a disruptive innovation (Tierney & Hentschke, 2007), market based strategies (Breneman, Pusser & Turner, 2000; Pusser & Doane, 2001, the federal government's regulatory reforms and resulting access to public funds (Kinser, 2006) were also cited as reasons for FPCU spread in the higher education industry. The following review will examine these insights and arguments through the theoretical lens of population ecology.

Niche formation. Population ecology goes beyond individual organizations and views organizations as groups occupying specific niche or resource space. The organizational niche refers to variation in production capacities and resource requirements among organizations within a population. Berg (2005) in *Lessons from the Edge* compared for-profits and other nontraditional providers of higher education in America to traditional providers of college education. Berg, a university administrator explored this topic through the lens of theories of competition, by using University of Phoenix (UOP) as a case study. He studied the characteristics of for-profits "with intent to learn its methods" (p9). Berg discovered two strong sociopolitical purposes to for-profits' mission. Along with serving corporate clients, these institutions care for social needs by providing access to first-generation college students who are underserved by traditional providers. According to Berg, it is a mistake to view for-profits as inferior competitors; truly they are unique institutions specializing in what traditional higher education providers are not yet able to deliver —universal access to postsecondary education.

In population ecology terms, Berg seems to be arguing that FPCUs succeeded because they picked up resources left behind by traditional providers, such as the first generation college students and the corporate customers. Customer preferences and new customers' creating new market niche has been studied in other industries (Romanelli, 1989). Abernathy and Clark (1985) have explained this type of differentiated services to underserved and unserved customer groups as innovative niche creation, in which organizations build on existing technical competence and apply it to emerging markets. Briefly, the socio-economic environment presented resources and opportunities, as a new niche and thereby supported FPCU emergence. This study tested the effects of niche formation in the socio-economic environment as *human capital supply and demand* and the *per capita income* in a locale and the odds of FPCU emergence in that locale.

Niche formation through disruptive innovation. Economics perspectives examine how conditions of environments may support the evolution of organizational form variations (e.g. Schumpeter 1939, 1950). The theory of creative destruction emphasizes industrial organization as a key influence on the likelihood of evolution of new organizational forms (Schumpeter 1939, 1950). Creative destruction is seen as a competitive response to new technologies which advances the emergence of new organizational forms. Astley (1985) emphasized technological innovation as the crucial space-creating variable. Romanelli (1991) notes, the idea of creative destruction and disruptive innovation reflects the views of niche creation as well. Tierney and Hentschke (2007) analogized FPCUs as a disruptive innovation in higher education. They argued, although most of the innovations in higher education are "sustaining innovations"[11] FPCUs are "disruptive innovations"[12], similar to disruptive technologies (p.5). They cite two

[11] Sustaining innovations does not create new markets or value networks but rather only evolves existing ones with better value, allowing the firms within to compete.
[12] Disruptive innovation helps create a new market and value network, and eventually disrupts an existing market and value network, over a long period of time such as decades

reasons to support their arguments. Primarily, FPCUs are disruptive innovators, because of their strategic focus on the simple mission of student teaching and learning. Secondly, FPCUs are innovators because they sought changes in the federal laws and managed to create a shift in public policy. Thus, FPCUs innovated in the public policy arena, commoditized teaching and learning and improved access to disadvantaged student population left behind by traditional providers. Therefore, Tierney and Hentschke argue that FPCUs disrupted the industrial organization of higher education and diffused in the environment. This study tests the influence of "industrial organization" of higher education using the number and type of incumbents in a geography and the odds of FPCU emergence in that geography.

Niche formation through new customer groups. Romanelli (1989) argued that "virtually any event or development that could fundamentally alter existing flows of resources, for example the changes in social values, the discovery or depletion of natural resources, changes in the demography of a human population, economic growth or decline, and so on—can effect a change in organizational resource space" (p.95). Moreover, members of an organizational field will differ in their abilities to attract resources for the innovation of new organizational forms. Thus, the opening of new resource spaces may depend on the dynamic interaction of exogenous change and existing constraining conditions (Astley 1985).

Morey (2004) examined the effects of for-profit emergence on traditional colleges and universities. She employed historical analysis and case studies of leading providers such as the University of Phoenix to arrive at her findings. She claims the needs of adult learners and rising cost of tuition at traditional colleges and universities helped for-profit's success. Morey concurs with Berg (2005) and Brenner, Pusser and Turner (2006) that FPCUs pose no real threat to TCUs because, for-profits arose to fix the market failure of traditional colleges and universities.

Kelly's (2001) study offer more insights into adult learner needs and the emergence and spread of FPCUs. Four characteristics that distinguish for-profits from traditional non-profit institutions are career orientation, customer focus, hands on learning approaches, and convenient campus locations. Kelly says these characteristics contributed to FPCU success in the industry. Coleman and Vedder (2008, p.26) also supports Morey's findings. They noted two main elements that contributed to FPCUs' successful spread, their ability to read and respond to market signals and their willingness to build their services around the student. The studies of Morey (2004), Kelly (2001) and Coleman and Vedder (2008) could be describing the phenomena of niche creation through fixing the market failure of traditional providers. The current study examines the influence economic, demographic and competition variables in a geographic location and the odds of FPCU emergence in that location.

Moreover, Berg's and Morey's assertion that "FPCUs pose no threats to traditional colleges and universities" imply that FPCUs and TUCs are not competitors in the environment. Recent studies from population ecology compared the relative advantages of competing populations based on their abilities to exploit evolving resource conditions. For example, a series of studies by Barnett and Carroll (Barnett & Carroll 1987, 1990, Barnett 1990) on competition and cooperation among forms of telephone companies during the early years of that industry. It clearly indicates that interactions and relationships of organizational forms affect the ongoing diversity of forms. In this study, I will demonstrate the influence of competition in a locale and the odds of FPCU emergence in that locale.

Resource partitioning. As mentioned in the introduction**,** Hannan and Freeman (1986, 1989) suggest that if existing organizations are stable, in both their forms and their relationships to one another, they will tend not to exploit any new resources that may become available in the

environment at large. Thus the new forms do not compete with the incumbents because they are entering a new resource space within the industry. Brenner, Pusser and Turner (2006) aimed to examine for-profits from an ecological perspective, but discovered that it was "difficult to pin down a specimen for the study" (p.ix) of for-profits, therefore profiled FPCUs through case studies of University of Phoenix, DeVry and Strayer. They concluded that market demand for higher education is the primary reason for the success of for-profits, but found it difficult to define the market for higher education using criteria such as products, geography or type of providers. They also predicted that the for-profits will grow as the overall market for higher education expands. Their rationale for this assertion was, for-profits served a segment currently underserved by traditional providers, namely working adults. Brenner et.al (2006) and Berg (2005) identified new consumer groups in degree seeking education namely "working adults". Both of them perceived FPCUs as non-threatening to the traditional colleges and universities. An organizational theory perspective of population ecology could have been helpful for Brenner et. al investigations.

In very similar context, Swaminathan (1995) analyzed founding rates of specialist farm wineries over a period of 50 years, starting shortly after the end of prohibition. Although results showed that farm winery foundings were lower in states with higher numbers of mass-production wineries, suggesting localized competition between these two organizational forms, consistent with resource partitioning theory, increasing concentration of generalist mass-producers increased the founding rate of specialist farm wineries.

***Specialists and generalists*.** Population ecologists argue that resource partitioning happens between "specialists and generalists" as they appear to operate in distinct resource spaces (Hannan & Freeman, 1989). Thus there is no visible competition among the incumbents

and the new form. Carroll (1985) proposed, in environments characterized by economies of scale, competition among generalists to occupy the center of the market frees peripheral resources that are most likely to be used by specialists. His model implies that in concentrated markets with a few generalists, specialists can exploit more of the available resources without engaging in direct competition with generalists. In the higher education industry, Levin (1997) conducted a study of undergraduate attitudes and experiences and found that older, part-time, and working students, especially those with children, wanted a different type of relationship with their college. He concluded that for-profit institution's focus on students as customers, and its willingness to offer services that minimize the amount of bureaucracy through which a student must navigate, helped for-profits to persist in the industry.

These arguments could be summarized as, the traditional providers failed to address the needs of working adults, first generation college students, working parents and corporate customers. Therefore, there was an abundance of unexploited resources in the environment and consequently FPCUs emerged to exploit these resources. Unexploited resources helping the emergence of new organizational forms were examined in other industries. Carroll and Swaminathan (1992) verified this concept by examining the evolution of strategic groups in beer industry. Swaminathan (I995) studied the proliferation of farm wineries in the American wine industry. Both of these studies confirmed the effects of left over resources in the form of customer preference for beer and wine products explained the emergence of specialty beer brewers and farm wineries in California. As will be explained later, this study examined the influence of generalists such as the public universities and colleges in a geographic resource space and the odds of FPCU emergence in that space.

The theory of niche formation says certain environmental conditions some time favor specialists over generalists. Then specialists could exploit uncertain market resources and narrow customer base and assumes more risk of failure, whereas generalist targets multiple environments and multiple customer groups and minimizes the risk of failure (Romanelli, 1991). The president of University of Phoenix (UOP) says the secret of UOP's and similar FPCUs' success could be attributed to their business strategies, division of labor, student focus compared to faculty focus and separating research from instruction (Noone, 2004). In ecological terms, UOP and its peers were specialists exploiting a narrow base of students while generalist incumbents such the public universities were focused low risk traditional student markets.

Population dynamics and density dependence. Research on foundings has paid attention to endogenous *population dynamics* and *density dependence* processes. Previous population dynamics and the patterns of founding, shape current founding rates (Delacroix & Carroll 1983). Initially, prior foundings signal opportunity to entrepreneurs, encouraging more founding. But as foundings increase further, resource competition increases, discouraging founding. Additionally, initial increases in the number of organizations can improve the institutional legitimacy of a population, enhancing the capacity of its members to acquire resources. However, as a population continues to grow, competition with others for scarce common resources intensifies. Together, these mutualistic and competitive effects suggest a curve-linear relationship between density and founding (Hannan & Carroll 1992). Swaminathan (1995) found out that, of the four causal factors on the level and dispersion of farm winery foundings, density dependence had the strongest effect. But, Delacroix and Solt's (1998) analysis proposed niche formation as the primary driver of California winery foundings. As will be demonstrated, I

examined the effects of density dependence and the odds of FPCU founding using the number of prior foundings in a location.

Conclusions

Historically, for the last 350 years, public and non-profit private institutions dominated the degree granting colleges and universities industry (Kinser, 2006). Today for-profit colleges and universities occupy a significant position in the industry. As demonstrated in this review, there is no sector-level explanation yet for the emergence and spread of this profit-based college form in a predominantly not-for-profit industry. Present day literature on FPCUs point towards market focus, corporate culture and profit motive as some of the institutional reasons for their success. Industry level privatization in the form of federal student financing regulations, disruptive innovations, and haphazard political lobbying resulting in misguided federal government priorities are cited as the ecological reasons for FPCU emergence and persistence (Breneman, Pusser & Turner, 2006; Harkin, 2012; Kelly, 2001; Kinser, 2006; Morey, 2004; Ruch 2001; Tierney & Hentschke, 2007)

As instrumental as they are, these insights do not culminate into a sector-level explanation for the emergence and spread of FPCUs as an organizational form in the environment. Schooling is an organized activity and emergence and spread of new forms of schools or colleges are an organizational achievement (Hannan & Freeman, 1977 & 1989; Hannan & Nielsen, 1977). Therefore, I illustrate in this study that ecological theories that helped to explain the emergence of new forms of organizations in other industries provide a better framework to understand and analyze the emergence and diffusion of FPCU form in the higher education industry. Ecological approaches to organizational founding studies constitute a radical departure from the entrepreneurship approach, which is focused primarily on individual initiative,

skills, and abilities. Ecological approaches, by comparison, emphasize contextual environments that produce variations in organizational founding rates over time by influencing opportunity structures that confront potential organizational founders.

Chapter 3

Methods

Introduction

This study concentrates on the emergence and spread of degree granting for-profit colleges and universities (FPCUs) that came into existence in the United States (US) since the 1970s. It addresses the interplay of environmental and organizational factors in the emergence and diffusion FPCUs. As discussed in the literature review, two theories are employed to explain FPCU emergence: (1) neo-institutionalism, and (2) population ecology theory. Neo-institutionalism suggests that socio-cultural elements stem from institutional factors such as regulative, normative and cultural cognitive institutions[13]. Often these institutions work in unison (Scott, 2014).[14] By adopting laws rules, norms and deep seated "shared mental models" (North, 1993) organizational forms achieve legitimacy and diffuses in the environment. Population ecology theory on the other hand explains how organizational populations arise as a result of niche formation in the broader organizational environment, which provides new populations with resources and growth opportunities. In this study I test the idea that both are involved in the emergence and diffusion of FPCUs.

Variables

The following sections describe the outcome and predictor variables stemming from above mentioned concepts. First I will address the uniqueness of the criterion variable used in this event history analysis. Then I will describe the predictor variables, which are organized by

[13] Traditions, customs, conventions and rituals

[14] Colleges are deemed eligible for federal funding by gaining a valid and active accreditation from one of the six regional accrediting agencies. But regional accrediting agencies adopted FPCU accreditation very slowly. It took nine years from very first agency adoption in 1976 to have the rest of the six agencies to adopt FPCU accreditation.

their theoretical underpinnings, population ecology and neo-institutionalism. I will begin with the definition of the outcome variable and its rationale.

Outcome variable. The outcome variable is the odds of FPCU foundings in a CBSA in any given year (from1975 to 2012) adjusted for the probability of previous foundings in the CBSA. This referred to simply as the hazard (risk of founding) in event history methodology. It is based on the time to founding (event) from a pre-specified origin. I observed 903 CBSAs for 38 years (1975-2012), which resulted in a repeated measure data set involving 34,314 CBSA-by-year observations. As mentioned in chapter one, founding or birth is defined as the appearance of a FPCU in a CBSA and in the IPEDS system as a four year degree granting, title IV eligible institution. For example appearance of a FPCU such as University of Phoenix (UOP) in Phoenix, AZ MSA is counted only once regardless of how many campus locations it may have in Phoenix, AZ MSA.

CBSA and Time Horizon 1975-2012. The CBSA (core based statistical area) is the basic unit of observation for the analysis. To draw an analogy, CBSAs can be viewed as beds in a hospital. Every time a patient dies in a given bed it is recorded and other characteristics associated with the bed are used as predictors. Time to death in the bed is the basis for the odds of dying as an outcome measure.

The rationale for selecting CBSA as the unit of analysis: The CBSAs are a suitable unit of observation for this study because on the demographic side 94 percent of the US population resides in 917 CBSAs of the mainland.[15]. Furthermore approximately 85 percent of the US population resides in Metropolitan Statistical Areas (MSAs) and about nine percent in Micropolitan Statistical Areas (μSAs). Moreover, the CBSA classification incorporates traditional geographical concepts such as counties, townships and boroughs. For example,

[15] Total 929 cbsa including US territories

among the 3,143 counties[16] of the United States, 1,167 are located in 381 metropolitan areas and 641 are located in the 536 micropolitan areas. The remaining 1,335 counties house population clusters less than 10,000, accounting for the remaining six percent of the total population. The level of economic integration in a CBSA is measured by the reach and complexity of intra-city and/or inter-city transportation infrastructure or simply commuting facilities in the CBSA. The metropolitan statistical areas represent higher level of economic integration than micropolitan areas. Therefore, 903 CBSAs observed for this study not only constitutes a national scale sample but also integrates metrics of local demography, geography and economic structure. There was not enough data for the remaining 14 CBSAs.

The rationale for adopting 1975-2012 as the time horizon: Although for-profit post-secondary institutions were in the environment for a long time, regionally accredited degree granting FPCUs appeared only after 1975 because regional accreditation became available to for-profits only after 1975. Therefore, the time line of this study begins in 1975 and ends in 2012, beyond which the archival data is currently incomplete. The for-profit colleges and universities are a distinct organizational form in the degree granting industry. Both public and non-profit private colleges were deemed as 501c3s by the IRS (Internal Revenue Service), hence they are tax exempt. For-profits including FPCUs are deemed as businesses and therefore FPCU profits are taxed as any other business entity in the country.

The following sections explicate the predictor variables, their relationship to the theoretical framework, the arguments that represent them, their definitions and their metrics. The first of set of predictors represent arguments based on population ecology and the second set of predictors represent arguments based on neo-institutionalism.

[16] The counties and equivalent entities used in the delineations of the metropolitan and micropolitan statistical areas are those that were in existence as of January 1, 2010 (OMB Bulletin No. 13-01, 2013). OMB updates the standards for delineating these two types of CBSAs every ten years.

Table 1

Theory, Hypothesis and Predictors

Population Ecology Theory (PET)	Related Hypothesis	Predictors	Variable Description
Niche formation stemming from changes in Statistical Areas	Levels of urbanization as density of population and commuting infrastructure explaining FPCU foundings	1. MSA (metropolitan statistical area) 2. CSA (combined statistical area) 3. Log of Population	Is CBSA metropolitan or micropolitan? Yes, or NO (urbanization) Is CBSA part of a combined statistical area? Yes, or NO? (urbanization) Annual population size of the CBSA
Niche formation and Labor market environments	Levels of human capital supply and demand explaining FPCU foundings	1. Δ3Some college 2. Δ3High school 3. Unemployment rate	3 year change in college dropouts above the age of 25 in CBSA labor force 3 year change in high school attainment in CBSA- above the age of 25 Annual unemployment rate in a CBSA
Niche formation and Economic environment	Economic environment as levels of employment in industry sectors and relative prosperity or poverty explaining FPCU foundings	1. Service/manufacturing ratio 2. Δ3Service employment 3. Per capita income in CBSA	Relative size of employment in service sector compared to manufacturing Three year change in service sector employment Indicator of relative poverty and prosperity in a CBSA
Resource partitioning among providers	Number and type of incumbents in a CBSA explaining FPCU foundings	1. Publics 2. Non-profit privates 3. Selectivity of publics	Number of public colleges and universities in a CBSA at the time of foundings Number of non-profit private colleges and universities in a CBSA at the time of foundings Range of selectivity in admission to publics 0-4
Self-generating density dependence	Greater the number of pre-existing FPCUs higher the number of foundings	1. Number of prior foundings (nfpcus)	Number of pre-existing FPCUs in a CBSA at the time of foundings
Neo-institutional theory (NIT)	Related Hypothesis	Variables	Variable Description
Isomorphic normative diffusion	The longer the CBSA exposed to regional accreditation the higher the odds of FPCU emergence in that CBSA	1. Exposure	Number of years the CBSA was exposed to regional accreditation
Isomorphic mimetic diffusion	Spread of FPCUs to contiguous CBSAs higher than non-contagious CBSAs	1.Contiguous births	FPCU births in contiguous CBSAs in a CSA

Table 2

Variable Names, Sources, Description of Metrics and Type

Variable Name	Source	Metrics of Description	Type
Cbsa-type	OMB	380 MSAs: higher level of social and economic integration and population. 523 μSA : Lower levels of social and economic integration and population	Categorical
Lnpop	Census Bureau	Log of yearly population by CBSA from 1975-2012	Continuous
Publics	IPEDS	Number publicly controlled colleges and universities in a CBSA	Continuous
Selectivity	IPEDS	0-4. 0=open…4= most selective	Categorical
Non-Profit Privates	IPEDS	Number of Privately controlled non-profit colleges and universities in a CBSA	Continuous
Number of FPCU	IPEDS	Number of FPCUs in a CBSA	Continuous
Unemployment rate	BLS	Rate of yearly unemployment by CBSA from 1975-2012	Continuous
3yr Δ in pct. high school completion	BLS	Percentage of change in high school diploma attainment in a CBSA by 3 year intervals	Continuous
3yr Δ in pct. some college completion	BLS	Percentage of change in some college attainment (but no degree) in a CBSA by 3 year intervals	Continuous
serv_manuf_ratio	BEA	Change in ratio of service industry employment to manufacturing industry employment by CBSA from 1975-2012	Continuous
3yr Δ in pct. service jobs	BEA	Percentage change in service employment in a CBSA by 3 year intervals	Continuous
Lnincome $2012	BEA	Log of per capita income of CBSA by year 1975-2012 in 2012 dollars	Continuous
CSA (Contig_births)	OMB	CSA=1= 497 CBSAs that are part of 165 Combined Statistical Areas. Combination includes MSA and MSA or MSA and μSAs or μSAs and μSAs. CSA=0=406 CBSAs that are standalone CBSAs.	Continuous
Exposure	IPEDS	Number years a CBSA was exposed to regional accreditation	Continuous
Regions	IPEDS	1=Middle States ; 2=New England; 3=North Central; 4=Northwest ; 5=Southern; 6= Western	Nominal
Decades	IPEDS	1= 1975-1985; 2= 1985-1994; 3= 1995-2004; 4=1995-2012	Nominal

OMB=Office of Management & Budget; IPEDS= Integrated Postsecondary Data Systems; BEA= Bureau of Economic Analysis; BLS= Bureau of Labor statistics

In the following section I will describe the data presented in Tables 1 and 2, the rationale for the predictors used in this study and how they are operationalized in the regression models.

Population ecology predictors. The population ecology predictors explains niche space creation in the resource environment resulting from changes in the environment, partition of

resources among providers that occupies the central and the peripheral spaces within the resource environment and the influence of prior foundings creating self-generating density dependent duplication of the form.

Statistical areas and CBSA population. The predictors representing the geographical settings and its demographic and economic conditions are: Two types of CBSAs (1) metropolitan statistical areas or MSAs and (2) micropolitan statistical areas (μSAs), (3) combined statistical areas or CSAs, which is a combination two or more metros and/or micros and (4) the annual population of the CBSA. Together, the demographic conditions and the economic conditions accounts for the level of urbanization in CBSAs. Population ecology posits that niche formation is not necessarily driven by a single element (Hannan and Freeman 1989), as in this case, multiple causes such as demographic changes and economic integration in CBSAs could lead to higher levels of urbanization. Thus micropolitan areas (μSAs), metropolitan areas (MSAs), combined statistical areas (CSAs) and the population trends in the CBSAs are projected to correlate with FPCU foundings.

Statistical areas. Economic ties *or economic integration* is measured as the intensity of commuting infrastructure, such as the highway systems, the metro-rail and the public metro-bus systems in a CBSA (OMB, 2010). The three distinct levels of urbanization among CBSAs are (1) The metropolitan statistical areas (MSAs) and (2) the micropolitan statistical areas (μSAs) and (3) combined statistical area (CSA). The statistical areas are categorical variables. 903 CBSAs were coded as MSAs, μSAs and CSAs. Furthermore, CBSAs that are part of CSA and not part of a CBSA were identified as well.

CBSA population. The annual population figures for each CBSA were entered for the years beginning in 1975 to 2012. Then log number of this population figures were calculated for

every year, one log unit increase in population translates to 2.7 times of growth in population from the previous level in a CBSA.

Incumbents. The predictors representing the incumbent environment are: (1) the number of public colleges and universities and (2) the number of non-profit private colleges and universities (3) pre-existing FPCUs compared to current founding— engaged in four-year degree education in a CBSA. Population ecology contends that "resource partitioning" between the center and the periphery of the organizational environment (Hannan and Freeman, 1989; Swaminathan, 1995) help new populations to emerge. The new form often do not compete with existing ones, but instead breed on resources leftover from the existing populations and thus complement them. In 2012, public, non-profit private and for-profit private colleges and universities account for about 3000 institutions enrolling 21 million students with an approximate annual expenditure of more than $300 billion (NCES, 2013).

Number of publics. Each CBSA in the observation group was coded with the number of public colleges and universities in it for the time period of observation. CBSAs with no publics were coded as zero. This predictor is treated as continues variable.

Number of non-profit privates. Similarly, each CBSA in the observation file was coded with the number of non-profit private colleges and universities in it for the time period of observation. CBSAs with no non-profit privates were coded as zero. This predictor is treated as continues variable

Selectivity. Each CBSA with public universities and colleges were further coded with range of selectivity in admissions. CBSAs with open admission publics were coded with 0 and most selective were coded with 4. CBSAs with no publics were left blank on the selectivity variable.

Number of pre-existing FPCUs. The number of FPCUs at the time of founding represents density dependence setting of the CBSA. Density dependence theory suggests that in the early stages of emergence, the greater the number of existing foundings the more likely the founding of new ones and this trend could be reversed in later stages. The previous founding patterns shape current founding rates (Delacroix & Carroll 1983). In other words, initial prior foundings signal opportunity to entrepreneurs, encouraging additional founding. In the early stages of foundings it is expected that the greater the number of pre-existing FPCUs the greater the number of additional foundings, but this trend could be reversed as the number of FPCUs reach environmental carrying capacity. Therefore, the founding rates could decline and result in an overall curve linear pattern of foundings. This is measured by the actual number of existing FPCU's in the CBSA at the time of a new founding. Each CBSA was coded with the number of pre-exiting FPCUs in the CBSA as compared to the current year of observation. This is a continuous variable as well.

Educational attainment and unemployment rates. Predictors representing the human capital environment, in other words, the labor market conditions are: (1) a three year change in the percentage of college dropouts; (2) a three year change in the percentage of high school completers and (3) the annual unemployment rate of the CBSA. The multi-causal nature of niche formation helps us to consider a wide range of factors related to FPCU emergence, such as the changes in the demand and supply of human capital in a CBSA. Human capital as educational attainment is an important aspect of labor market environments (Fraumeni, 2015). The levels of educational attainment among the adult population of geography constitute the supply side of the human capital environments (Lawrence & Rothschild, 1993; Fraumeni, 2015).

The unemployment rate indicates the demand side of the labor market environments (Card and DiNardo, 2002; Lawrence and Rothschild, 1993).

Educational attainments. In 1970 about half of the US adult population showed educational attainment of less than a high school diploma and about $1/10^{th}$ of the population attained a four-year college degree or more. In the 80s, 90s and in the 2000s, level of educational attainment grew significantly among the adult population. For example in 2011, less than 15 percent of the population showed educational attainment less than a high school diploma (US Census Bureau). This shows the variations in the levels of human capital as labor market resources in the nation during the last four decades. The current attainment trends are indicative of the prior demand. Hence, educational attainment is treated as a lagged variable. A three year change in educational attainment is indicative of the recognized demand for more educational services at least three years ago, which created the present supply. Therefore, changes in the levels of educational attainment in CBSA represent supply side of human capital environment. Every CBSA observed was coded with the three year change in the share of educational attainment levels from 1975-2012. This is a continuous variable.

Unemployment rates. Often labor markets are not 100 percent efficient. Changes in the structure of the economy, such as the shift from manufacturing to service producing industries and mismatch between the supply and the demand of laborers with necessary skill sets could cause unemployment to rise. In such a situation, higher levels of education to make workers more attractive to employers are one of the policy solutions (Autor, Levy, and Murnane, 2002; Karloy, and Panis, 2004). Note, high school completers and college dropout population forms potential student resources for for-profit colleges (Berg, 2005; Kelly, 2001 & Morey, 2004). Autor, Levy, and Murnane (2002) argue that skill biased technical changes (SBTC) as one of the

reasons for rise in demand for formal education such as college degrees by working people. Thus, the supply and the demand for human capital measured as high school attainment rates, college dropout rates and the unemployment rates could be correlated with the time to birth of FPCUs in a CBSA. The demand side of labor market environment is represented through unemployment rates. The unemployment rate is a measure of the incidence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by all individuals currently in the labor force. 903 CBSAs were coded with the annual unemployment rate for years 1975-2012. All three labor market predictors are continuous variables.

***Employment and income*.** The predictors representing the economic environment of the CBSA are: (1) relative size of service industry employment compared to manufacturing industry employment (2) a three year change in the levels of service industry employment and (3) the per capita income of the CBSA. Population ecology theory suggests, new organizational forms arise as a result of economic shifts, (Hannan and Freeman 1989) and technological innovations (Abernathy and Clark 1985). Research in labor economics suggests that there is a strong relationship between employment structure and the demand for higher education (Bauer and Yamey, 1951; Card and DiNardo, 2002; Jorgenson and Timmer, 2011; Kuntez, 1953; Wolfe, 1995).

The US Bureau of Labor Statistics (BLS) conducted two major studies, one in 1973 and the other in 1993 to examine the nature of employment by industry sectors in the United States 1950-70 and 1970-1990. Although the first period (1950-70) showed a shift in employment from traditional agricultural and industrial sectors to the service sector, in the second period (1970-1990) the shift was much more significant. Moreover, the employment increased by 50 percent and the services sector accounted for 72 percent of the employment. In other words, in

the 1970s and in the 1980s, as the goods-producing sector lost jobs, the service-producing jobs continued to grow. Today, in the 21st century the service industries and its sub sectors are the largest part of the US economy, employing two thirds of the workforce (US BEA, 2012). This restructuring in economy and employment was so significant that BEA adopted the NAICS[17] method to report service industry GDP and employment trends (US BEA, 2001).

Consequently, people needed more human capital (knowledge and skills) in form of college education to engage in the new economy (Bauer and Yamey, 1951; Card and DiNardo, 2002; Kuntez, 953; Wolfe, 1995; Jorgenson and Timmer, 2011). This type of change often referred to as *skill-biased technical change* (SBTC) finds support in BLS research. SBTC research shows that the underlying cause for demand for more education arose from changes in the demand for workplace tasks, stemming from technological changes. More significantly, it is not merely a reflection of relative demand shifts favoring educated labor (Autor, Levy, Murnane, 2001) but demand for new skills for incumbent workers as well.

Employment. 903 CBSAs were coded with change in number of manufacturing jobs to service industry jobs as a change ratio. Secondly, CBSAs were coded with a three year change in the number of service industry jobs as a share of the total number of jobs in the CBSA.

Per capita income. 903 CBSAs were coded with the annual per capita income of the CBSA. The log number of this figure was adopted as a predictor variable. One log unit increase equals 2.7 times growth in per capita income from previous levels. Employment and income predictors are continuous variables.

Neo-institutionalism predictors. Neoinstitutionalism explains the isomorphic diffusional effects of forms and practices across time and space (Jepperson, 1991). The

[17] NAICS North American Industry Classification System

normative, mimetic, spatial and temporal diffusional effects are represented by *exposure, contagion, accreditors* and *decade* variables respectively.

Exposure. The predictor *exposure* represents the number of years a CBSA was exposed to regional accreditation by one of the six accrediting agencies. Accreditation by a department of education (DOE) approved agency is a requirement to qualify for title IV funds (HEA, 1972). Thus regional accreditation not only enables FPCUs to offer four-year degree education but also offer access to federal funds. The six regional accreditors opened up their respective states and territories for FPCU accreditation only after 1975. The New England region was the first to offer FPCU accreditation in 1976 and the Western Region was the last (1985). So, there was nine years of lag in achieving nationwide openness to regional accreditation.

Scott (2014) argues, regulatory and normative compliances are often layered, one on top of the other. For example, the eligibility for federal student financial aid and the approval to offer four-year degree education are inter-related. Thus number of years regional accreditation was available in a CBSA represent not only normative controls but also regulatory controls. Hence it is expected that the number of years a CBSA was exposed to regional accreditation will be correlated with the odds of FPCU emergence and FPCU diffusion in that regions. CBSAs were coded with its respective accrediting region and then entered the year the CBSA came under the purview of liberalized accreditation policies by its respective regional accreditor. Predictor Exposure is a continuous variable.

Contagion. The predictor contagion represents the number of FPCU foundings in adjoining CBSAs that are part of a combined statistical area. Neoinstitutionalism suggests that organizational forms spread in the environment through mimetic isomorphism. March and Olsen (1976) say when organizational technologies are poorly understood and the goals are ambiguous,

or when the environment creates symbolic uncertainty, mimetic isomorphism occurs in the institutional environment. Therefore, CBSAs that are contiguous could imitate the founding behavior of proximate CBSAs that experienced FPCU foundings.

Mimetic isomorphism signifies not only imitative duplications, but also imitative spread (Jepperson, 1991). In other words, the process of diffusion itself could be *contagious*, infecting adjoining geographies. Thus it is expected that the effects of proximity and visibility to FPCU foundings in one CBSA could explain the emergence of FPCUs in a neighboring CBSA. Out of 903 total CBSAs 497 had one or more neighboring or adjoining CBSA. They were identified as part of 165 combined statistical areas (CSAs). The CBSAs within a CSA were coded as contiguous and recorded the foundings in these adjoining CBSAs by year of the founding. The predictor contiguous birth is treated as continues variable.

Nominal variables.

The following paragraphs will describe the nominal variables employed to create the reduced data sets by six regions and four decades of the 38 years of observations.

Accreditors. The variable *accreditors* represent the six regional accreditors and the respective regions that were under their purview. Strang and Meyer (1993) interpreted the idea of institutional isomorphism as structural conditions that speed up diffusion. Thus it is anticipated that the national (spatial) diffusion (Baum and Amburgey, 2000) of FPCUs could be explained by the variation in spread among the six accrediting regions of the US. This is a nominal variable with each accreditor representing a category. CBSAs under the purview North East accreditor were codes as 1, CBSAs under Middles States accreditor codes as 2, North Central CBSAs were coded as 3, North West CBSAs as 4, CBSAs' of the South region as 5 and

finally CBSAs of the West region as 6. This is a nominal variable. The states and the share of CBSAs are described in Chapter 4 under region specific model results.

Decade. The variable decade represent the four decades of the time horizon of FPCU emergence from 1975 to 2012. Neoinstitutionalism suggests that the diffusion of new organizational forms may be influenced by the time frames as well. Thus it is expected that the temporal diffusion of FPCUs could be explained by the four decades of this observation, 1975-1984 was categorized as decade-1 (2) 1985-1994 were codes as decade-2; (3) 1995-2004 were codes as decade-3 and (4) 2005-2012 were codes as decade-4. This is a nominal level variable.

Cox Regression

Cox Regression is a contemporary method for predicting the odds of organizational foundings based on event history data. It estimates the odds of founding in a given unit of observation (for example CBSA) as a function of other measures of that unit (Allison, 2010). Although event histories are effective for studying the causes of events, they also typically possess two features —*censoring* and *time-dependent explanatory variable* —that create major difficulties for standard statistical procedures (Allison, 1982, 2010). Censoring occurs when an observation is terminated before the event happens. Time-dependent variables are those that may change in value over time. Event History Analysis compensates for these difficulties (Allison, 1982, 2010).

Most methods for analyzing event histories assume that time is measured as a continuous variable. That is, it can take on any non-negative value. In some situations, events can occur at regular intervals such as a presidential election and in other situations events can occur at any point in time, but available data records only the particular interval of time in which each event occurs. Under such circumstances, discrete-time models and methods may be more appropriate

(Allison, 1982). An important feature of discrete-time models is it allows for incorporating time-varying explanatory variables such as the labor market environments or per capita income of a CBSA for a period of time.

Hazard function. The odds of founding estimated by Cox regression is expressed by what is known as the hazard function. Cox regression is uniquely suitable for the analysis in this dissertation because it can account for the repeated measures nature/structure of the data.

$$h(t) = \lim_{\Delta t \longrightarrow 0} \frac{P(t \leq T < t + \Delta t / T \geq t)}{\Delta t}$$

Hazard function is defined as the risk or probability of the event happening between *t* and *t+Δt,* where *Δt* is nearly 0, given that event has not occurred before *t.* Putting it in words, the probability that if the individual survived to time *t*, the individual will succumb to the event in the next instant. Thus hazard function aims to quantify the instantaneous risk that an event will occur at time *t.* Since time is continuous the probability that an even will occur at time *t* is *0.* But it is possible to describe the event occurring in the small interval between *t* and *t+Δt,* conditional on the individual surviving to time *t.* If the individual already experienced the event, they are no longer at the risk of the event. Thus hazard function considers only those who have survived to the beginning of the interval (*t,t+Δt*). The numerator, Pr [t ≤ T <t+Δt| T≥ *t*] in the equation represents this. The notation $\lim_{\Delta t \to 0}$ is a short hand for *the limit as the width of the interval Δt gets infinitesimally small* (Allison, 2010). So the hazard expresses the probability that an event occurs within a very small interval of time (given that an event has not already occurred). For this reason, the hazard function is also commonly known as the instantaneous risk. Other terms for h (t) include the hazard rate and failure rate. The survivor function is the probability that no event has occurred before time *t:* $S(t) = \Pr\ (T \geq t)$. Individuals who have

not yet experienced the event are said to have 'survived'. The term 'survivor' comes from biostatistics where the event of interest is often death. Note, that it is a decreasing function of t = S0=1, and S(t) →0) as t→∞. *T= time from the base line to event*. In this study, the time from 1975 to births of FPCUs in CBSAs.

Models. The following single comprehensive Cox regression model will be utilized in three different ways in this dissertation.

$$log\ h_{ij}(t) = \alpha(t) + \boldsymbol{\beta}\mathbf{X}_{ij} + \varepsilon_{it}$$

where i=CBSA, j=year, and $h_{ij}(t)$ denotes the hazard (risk) of *any* FCPU founding in CBSA *i* in year *j*. α (t) represents the baseline hazard function assumed to be proportional across all units in the data and thus cancels out. **X** is a vector of 15 predictors, shown in table 1 and table 2.

The above mentioned model will be first fitted on the entire data set meaning, *all CBSA-by-year* observations. This model will help predict the average effect of each predictor on the odds of founding regardless of the particular time periods or geographic regions. Following the entire data set model, the same model will be fitted on periodic segments of the data. This implies multiple runs for specific intervals. These intervals are (1) 1975-1984, (2) 1985-1994, (3) 1995-2004 and (4) 2005-2012. They are relevant because the model will predict the effect of each predictor on the odds of founding for a shorter period, hence could assess the influence of predictors across specific intervals. Then the same full data set model will be fitted on geographic region data. This implies multiple runs for specific geographic regions of the US. These regions are (1) New England, (2) Middle states, (3) North Central, (4) North West, (5) South, and (6) West. They are relevant because the model will predict the effect of each predictor on the odds of founding in a specific region. Hence it could assess the influence of predictors in specific regions. Finally, the data will be fitted on a reduced data set involving only

those CBSAs that have an adjoining or neighboring CBSA. Out of the total 903 CBSAs, 497 CBSAs match this description. Contiguous CBSAs groups are also called CSAs. There are 165 such CSAs housing the previously mentioned 497 contiguous CBSAs. The purpose of this particular procedure is to test the contagion effect in light of institutional theory. This theory suggests that the greater the number of similar organization in neighboring locales (CBSA), the more likely the founding of new ones in adjoining locales. This idea can only be tested on a CBSA that have adjoining or neighboring CBSA, hence the reduction. In the following section, I will describe the Cox regression models, the arguments tested and the rationale for step-wise entry of predictors into the regression models.

Procedures

There are four major steps in conducting the analytical procedures. In step-one the model is fitted with all observations of cbsa-by-year for 903 CBSA by 38 years. In step-two the model re-fitted by periods, resulting in four interval specific models. In step-three the model is again re-fitted by specific geographic regions, resulting in six region specific models. Finally, in step-four the model is re-fitted with reduced version of full data set in order to test the contagion effects.

Running full data set. The full data set model tested the arguments of hypothesis one to six. Predictor variables representing each argument were entered as a group in a step-wise pattern to test the stability of each coefficient. As displayed in table-1, effects of urbanization labor market conditions and employment and income (model-1) tested niche formation in the environment and the risk for FPCU births. These arguments were presented in hypothesis 1, 2, and 3. Model-2 tested arguments of resource partitioning and density dependence, presented in hypotheses-4 and finally. Model-3 tested normative isomorphism argued in hypothesis 6.

Running by reduced data set. The reduced data set tested the argument presented in hypothesis-7, the contagion argument. The contagion argument involved only 497 adjacent or neighboring CBSAs causing mimetic spread of FPCUs in the country. Predictors were entered into the regression model in the same manner as the full model. Analytical procedure Cox regression was performed in the same manner as the full model, and standard error, z-statistics and p-values were clustered on id CBSA code.

Running by decade data set. Period specific model or temporal model consists of four sub-models representing decades 1 to 4 of 38 years of observation. This model tested the influence of the same environmental predictors tested in the full data run, but for a shorter period of observation. Therefore, the arguments and the related predictors are same as the full data set run. The observational data was stratified by three 10 year periods and one eight-year period and risk rate for each period was assessed separately. The predictor contiguous birth was excluded from the temporal model due to fewer observations in each decade compared to the full model. The predictors were entered into the regression model in the same manner as the full model. Analytical procedure Cox regression was performed as in the full model.

Running by regions data set: Region specific model consists of six sub-models representing six geographic regions under the purview of six regional accreditors. This model also tested the influence of environmental predictors previously tested in the full data set run, but for a smaller geographic space, hence fewer observations. The predictor exposure was excluded from the spatial model because of collinearity with regions. Predictors were entered into the regression model in the same manner as the full model. Analytical procedure Cox regression was performed in the same manner as the full model. Table-3 below displays the descriptive statistics followed by a description of the predictor variables and their related theories.

Table 3

Descriptive Statistics

Descriptive Statistics

Theory	Predictor Groups	Predictor Description	Measure	Min	Max
Niche Space	Geographic forces	MSA (metropolitan statistical area)	1=CBSA is MSA with high-level of social/economic integration (380)	0	1
			0=CBSA is micropolitan, lower-level of social/economic integration (523)		
		CSA (combined statistical area)	1=CBSA is part of a CSA, involving multiple CBSAs	0	1
			0=CBSA is not part of a CSA		
		Population	Annual residential population of the CBSA	5,459	19,800,000
		Log of populaton	Log number of population	8.61	16.8
	Labor market conditions	Growth in high school attainment in CBSA	3-year change in % of 25 plus year-olds who finished high school	-2	915.459
		Growth in college dropouts in CBSA	3-year change in % of 25 plus year-olds who dropped out of college	-1069	414.458
		Annual unemployment rate		2.242	17.367
	Employment and income	Service to manufacturing ratio	The ratio of the number of service jobs to the number of manufacturing	0.0204	7.718
		Growth in service industries employment in a CBSA	3-year change in the percentage of service sector jobs out of all jobs	-1	388
		Per capita income	per capita income of the CBSA in 2012 dollars	0	116978
		log of per capita incme	log (per capita income of the CBSA)	7.69257	11.670
Resource partitioning	Incumbents	Publics	Number of public colleges and universities in CBSA at the time of founding	0	26
		Public's selectivity	selectivity range from open=0 to most selective=4	0.43	2.57
		Non-profit privates	Number of nonprofit private colleges and universities in CBSA at the time of founding	0	63
Density dependence	Number of prior foundings	Number of existing FPCUs in CBSA	Number of existing FPCU at the time of the founding	0	7
Normative diffusion	Exposure	Exposure to FPCU regional accreditation	Number of years the CBSA was exposed to FPCU regional accreditation	27	36
Contagious diffusion	Contigous births	Founding in neighboring CBSAs	Number of foundings in adjoining CBSAs within a CSA	0	42

The descriptive statistics shown in table 1 includes annual of per capita income of the CBSA in 2012 dollars (*income_2012*) and annual count of CBSA population *(pop*). The variables *lnincome* and *lnpop* are log numbers of income and population respectively.

Description of Predictor Variables

Table-3 displays the predictor names, the definitions and their descriptive statistics. There are three set of predictor variables representing changes in the external environment pertaining to niche space formation in the resource environment. They are geographic forces, labor market conditions and employment and income conditions of CBSAs. The first set of environmental predictors, two types of CBSAs, Combined Statistical Areas (CSAs) and the residential population of the CBSA represent geographic forces. Cbsa_type (1) represent 381 metropolitan statistical areas (MSAs). MSAs have populations of 50,000 or more and have robust inter-city and intra-city transportation infrastructure. Overall, these 381 MSAs represent 87 percent of the US population. cbsa_type (0) represents 522 micropolitan statistical areas (μSAs). They have population less than 50,000 but more 10,000. Overall these 522 micropolitan areas represent only 9 percent of the total US population. CSA (1) represent CBSAs that are part of a CSA, 492 CBSAs were part of a CSA. CSA (0) represents CBSA that are not part of any CSA, 411 were standalone CBSAs. During the 38 years of observations, the population of CBSAs ranged from 5,459 to 19.83 million.

The second set of environmental predictor variables pertaining to niche space formation is represented by the labor market conditions in CBSAs. Those are, a three-year change in the percentage of individuals 25 years of age and older that finished high school, a three-year change in the percentage of 25 plus year-olds that dropped out of college and the annual unemployment rate of the CBSA. Among the 903 CBSAs observed for 38 years, change in high school completion rates ranged from -2 percent to 915 percent. Change in some college attainment ranged from -1069 percent to 414 percent and unemployment rate in 903 CBSAs ranged from 2.2 percent to 17.4 percent during the 38 years of observation.

The third set of environmental predictor variables pertaining to niche space formation are represented by changes in the employment structure and the per capita income of the CBSA. Service-to-manufacturing jobs ratio indicates the ratio of number of service jobs to number of manufacturing jobs; a three year change in percentage of service industry jobs represents the change in the percentage of service industry jobs compared to all jobs in a CBSA. During this observation period among the 903 CBSAs, changes in the share of services industry jobs ranged from -1 percent to 388 percent. Changes in the ratio of service-to-manufacturing jobs ranged from .02 to 7.72 points. Per capita income of 903 CBSAs during this observation period ranged from $2,192 to $116,978 (in 2012 dollars).

The fourth set of predictor variables related to resource distribution (partitioning) in the founding environment are measured by the number of public and non-profit private colleges and universities, along with selectivity in admission to public colleges and universities. Among the 903 CBSAs observed for 38 years, the number of public institutions ranged from 0 to 26 and the number of non-profit privates ranged from 0 to 63 in CBSAs. Selectivity in admission to public institutions ranged from 0 indicating open admissions to 4 indicating most selective.

The predictor variable related to density dependent self-duplication of the form is the number of pre-existing FPCUs in a CBSA at the time of additional founding. During this observation period, among the 903 CBSAs, the number of pre-existing FPCUs ranged from 0 to 7. The predictor variables representing diffusion of FPCU organizational form in 903 CBSAs are *exposure* and *birth in contiguous CBSAs*. The exposure to liberalized FPCU accreditation policies in 903 CBASs range from 27 years to 36 years. The availability of regional accreditation is a trait of the CBSA, like transportation infrastructure. The contagious births

were the number of FPCU births in adjoining CBSAs within a CSA. Among the 492 CBSAs with adjoining CBSAs, births ranged from 0 to 42.

In sum, the above sections defined and described the scope of this study, translated the hypotheses into criterion and predictors variables. It also described the analytical procedure of event history regression that was employed to assess the influence of environmental conditions and the risk of FPCU foundings in 903 CBSAs. The next chapter describes the results from Event History Regression runs predicting the odds of FPCU foundings among 903 CBSAs for 38 years.

Chapter 4

Results

Introduction

This chapter summarizes the results of the analyses on the full data set models and its three subsets to answer the research questions guiding this study. Four distinct but related Cox regression models seek to explain the birth and diffusion of For-profit Colleges and Universities (FPCUs) in the US from 1975-2012. The period specific and region specific models are subsets of the full model, stratified by time and space. A reduced data set tested the imitative diffusion of FPCUs in adjoining or neighboring Core Based Statistical Areas (CBSAs). All models tested the influence of predictors stemming from the theoretical framework guiding the study. A set of organizational founding theories helped to identify ecological and institutional conditions in the founding environment and predictors representing those conditions were tested by the time to birth of FPCUs.

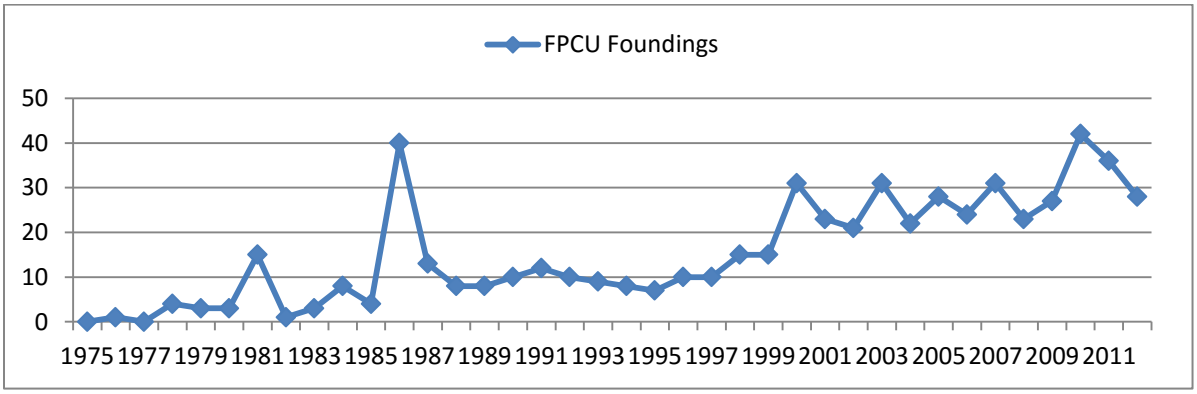
The first nine predictors, based on population ecology theory of niche space formation, consisted of geographic factors, demographic traits of CBSAs, labor market conditions, and the economic environments of CBSAs. In this study niche space formation refers to the formation of a narrow range of resources such as a potential student market or other social and economic resources that could support the founding of FPCUs. Another set of predictors about existing degree granting colleges was included to test the role of resource distribution based on population ecology theory. The number of incumbent FPCUs in the CBSA at the time of the founding of additional ones was included to test the notion that FPCU founding is self-generating. Finally, the full model included a set of predictors to test isomorphic diffusion as

suggested by neoinstitutional theory. The predictor exposure represents the length of time FPCUs were eligible for regional accreditation in particular CBSAs.

The time period specific models assessed the influence of the predictors employed in the full model for a shorter observation period defined as a decade. The region specific models tested the influence of full model predictors in six US geographic jurisdictions under the purview of six regional accrediting agencies. Finally, the reduced data model tested the extent to which FPCU foundings were influenced by FPCU existence in neighboring CBSAs, defined as contagious diffusion.

Founding patterns. To understand the FPCU founding patterns, the total number of foundings by year was tabulated and graphed. Figure 1 shows the founding patterns of FPCUs from 1975-2012. The rise and slope of the graph indicates the ebbs and flows in the founding pattern during this observation period.

Figure 4. Founding Patterns



Although the curve is not smooth, the founding rates increased in the early years, and then declined and then rose again. In 1986 there was a significant spike in foundings as West region was opened for regional accreditation in 1985. From 1975-1990, on average nine FPCUs were founded. There is a noticeable dip in founding patterns in the 1990s but foundings picked

up pace in the 2000s. From 2000-2012, the founding rate increased to 28 foundings per year. A total of 584 foundings occurred during the 38 years of observation.

Regions and decades. Regions 1 to 6 represent six US geographic regions under the purview of six regional accrediting agencies and decades 1 to 4 represent four time periods of the 38 years of observation. More detail on period specific data models is provided later in this chapter.

Event history analysis. In event history analysis, the likelihood of an event occurrence is defined as the hazard rate. Thus, although this study explains the birth of FPCUs, the regression coefficients are called "hazard rates" or "hazard ratios. The results of the Cox regression for the full model are shown in table-2. The coefficient *hazard ratio* is similar to an odds ratio in logistic regression and it is the estimated effect of a predictor on the hazard or the risk of FPCU founding in CBSAs at any point for the entire period of 1975-2012. The *hazard rate or risk rate* is the conditional probability that an event (FPCU birth) occurs at a particular time interval *(t)* (Allison, 2015). In other words, the risk is how long it takes to establish a FPCU in a CBSA, given the environmental conditions in the CBSA. The Cox regression efron method, exponentiates the *hazard rate* to *hazard ratio*, thus it explains the effect of one-unit increase in a predictor and its relation to the risk of FPCU foundings. The hazard ratio is always a positive value and a value of 1 means no effect.

Full Data Set Results

The full data run includes four regression models**,** estimating the risk of FPCU founding in 903 CBSAs over the 38-year period considered in this study. Predictors were entered in a step-wise fashion to observe the stability of regression coefficient hazard ratio. The hazard ratio and its statistical significance explain the relationship between the environmental conditions in

CBSAs and the likelihood of FPCU foundings. Hazard ratio indicates the magnitude of predictor effects and p-value indicates the statistical significance of the regression coefficient, hazard ratio. The following paragraph re-states the arguments tested in the full data run and reduced data runs, testing contagious or imitative founding.

Regression models sought to test the following hypotheses. *Hypothesis 1* argued that geographic forces such as the residential population and urbanization level are expected to have a positive relationship with FPCU founding. *Hypothesis 2* argued that labor market conditions, such as growth in high school diploma holders and college dropouts in a CBAS are expected to have a positive relationship with FPCU foundings. *Hypothesis 3* says economic factors such growth in service industry jobs and per capita income of the CBSA are expected to have a positive relationship to FPCU foundings. *Hypothesis 4* says the density of public and non-profit private colleges and universities to be positively related to FPCU foundings. *Hypothesis 5* argues that the greater the number of existing FPCUs, the more likely the founding of new ones. *Hypothesis 6* says the earlier the CBSA comes under the preview of a regional accrediting agency open for FPCU accreditation, faster the diffusion of FPCUs in that CBSA. *Hypothesis 7,* argues that the spread of FPCUs in adjacent CBSAs within a combined statistical area (CSA) to be contagious, in other words neighboring CBSAs may imitate each other.

The following sections describe the results from the full data set, cbsa-by-year observations. Results from the full data set models, shown in table-2 below, report the average risk of FPCU founding across 903 CBSA over the 38-year period. Because the results from the various models do not change that much, I discuss results from model-4 of the full data run, where all predictors representing hypothesis 1 to 6 are present. Model-5 discusses the results of hypothesis 7.

Table 4

Cox Regression Results Predicting the Founding Risk of FPCUs, 1975-2012

Full Data Set Run
Cox regression Efron method for ties. (Std. Err. adjusted for 897 clusters in cbsacode). Model 5 Reduced Data set (Std. Err. adjusted for 492 clusters in cbsacode)

		Model 4	Model 5*
Niche space	CBSA type 1=MSA	6.376 ***	—
		1.956	—
		2.262	—
	CBSA part of a CSA	1.093	—
		0.134	—
		0.208	—
	Log(population)	4.207 ***	5.186 ***
		0.276	0.346
		0.483	0.655
	Three year change in % of high school completers	0.992	0.991 **
		0.004	0.004
		0.006	0.006
	Three year change in % with some college education	1.024 *	1.027 **
		0.008	0.009
		1.024	0.013
	Percent unemployed	0.790 ***	0.801 ***
		0.022	0.024
		0.048	0.052
	Service/manufacturing ratio	0.042 ***	0.032 ***
		0.010	0.008
		0.020	0.018
	Three year change in % employed in service sector	1.006 **	1.006 **
		0.002	0.002
		0.002	0.002
	Per capita income in $2012	1.000 *	1.000 ***
		0.000	0.000
		0.000	0.000
Resource partitioning	Number of public univ. at time of founding	1.049 *	1.035
		0.017	0.017
		0.028	0.027
	Number of nonprofit private univ. at time of founding	0.971 ***	0.969 ***
		0.006	0.006
		0.008	0.009
	Public selectivity in admissions	1.183	1.196
		0.128	0.138
		0.226	0.258
Density dependence	Number of FPCUS at time of founding	3.267 ***	3.094 ***
		0.134	0.139
		0.352	0.360
Normative diffusion	Exposure to regional accreditation	1.334 ***	1.360 ***
		0.038	0.042
		0.082	0.092
Contagious diffusion	Founding in neighboring CBSAs	—	1.019
			0.008
			0.014
	Wald chi-square	1734.940	1732.990
	Log-pseudolikelihood	-3468.070	-2714.355

Significance: *** p<. 01; **p<.05; *p< 10

* contagion model

Note: Model 4 and Mode 5 colums displays regression coefficent Hazard ratio, Simple Error and Robust Error of regression coeffiecent hazard ratio of each predictor

Table-4 above displays the Cox regression results: hazard ratios, standard errors, and robust errors of the full model-4 and the contagion model-5.

Model four results. Model-4 includes six sets of predictor variables representing three different external environments, two types of incumbents, prior FPCU founding in CBSAs and the number of years a CBSA was exposed to regional accreditation. Among the first set of predictors representing the geographic environment, MSAs were 6.376 ($p<.001$) times more likely to experience FPCU foundings that micropolitan areas. A one unit increase in CBSA population correlated positively and significantly with 4.207 ($p<.001$) times or 321 percent of FPCU founding risk after controlling for the effects of all other predictors. Using the formula [100 (HR–1) %] for describing the percentage of change in the hazard ratio for one-unit increase in the predictor, 100 (4.207 -1) translates to 321 percent of FPCU founding risk for one-unit increase of population. Therefore, MSAs indicating higher levels of economic integration and growth in CBSA's residential population were strong predictors of FPCU founding in CBSAs.

Among the second set of predictors representing labor market conditions, a three-year growth in college dropout rates and annual growth in unemployment rate correlated significantly to the risk of FPCU founding. A one percent growth in college dropout rates correlated positively with 1.024 ($p<. 0.10$) or 2 percent increase in founding risk whereas, a one percent growth in unemployment rate correlated negatively with 0.790 ($p<.001$) with 21 percent reduction in founding risk. The third labor market predictor, a three-year growth in high school completion rates, was non-significant after controlling for the effects of exposure in model-4, although it correlated significantly but negatively in earlier models. Thus in model-4 when controlling for all other environmental predictors, growth in college dropout rates and higher demand for human capital indicated by lower unemployment rates supported the likelihood of FPCU founding.

Among the third set of predictors representing changes in the employment environment and income of the CBSA, two correlated significantly to founding risk. A one percent growth in service-to-manufacturing job growth correlated negatively with 0.042 ($p<.001$) times or 96 percent reduction in founding risk. However, a one percent growth in service industry employment correlated positively with 1.006 ($p<.05$) times or a one percent increase in founding risk. Thus, among the employment predictors, service industry job growth supported the likelihood of FPCU founding, while change in the structure of employment from manufacturing-to-service, reduced the likelihood of FPCU foundings, after controlling for the effects of all other predictors. Per capita income of the CBSA was non-significant.

The predictors representing resource sharing in the environment were incumbent public and non-profit private colleges and universities, in CBSAs at the time of the founding. The number of public and non-profit private colleges and universities correlated significantly with the odds of FPCU founding. One public university in a CBSA correlated with 1.049 ($p=0.095$) or 5 percent increase in the odds of FPCU founding. But one non-profit private university in founding CBSA correlated negatively with 0.971 ($p<.001$) times or 3 percent reduction in the odds of FPCU founding after controlling for the effects of all other predictors. Selectivity in undergraduate admissions to public universities was not significantly correlated to the risk of FPCU founding after controlling the effects of exposure. This finding suggests that the existence of public universities in a CBSA somehow encourages foundings of FPCU whereas the existence of non-profit private colleges and universities discourages such foundings.

The number of pre-existing FPCUs at the time of founding correlated significantly and positively to the likelihood of additional FPCU founding after controlling for the effects of all other predictors. One pre-exiting FPCU in a CBSA at the time of founding correlated with 3.267

($p<.001$) times or 227 percent more risk for additional founding. Thus presence of pre-existing FPCUs at the time of founding improved the odds of additional founding by two fold, after controlling for the effects of all other predictors.

Exposure, the number of years a CBSA was exposed to policies allowing FPCUs to be regionally accredited, correlated positively and significantly to the risk of FPCU founding. An additional year of exposure to FPCU regional accreditation in a CBSA increased the odds of founding by 1.334 ($p<.001$) times or 33 percent. Thus exposure to liberalized regional accreditation policies in CBSAs facilitated the spread of FPCU in the US.

Reduced Data Set Results--Contagion

Model-5 tested the notion that CBSAs next to a CBSA with FPCUs would be more likely to experience FPCU foundings. For this analysis, I used a reduced sample of CBSAs from the full data set that had a neighboring or contiguous CBSA. There were 492 such CBSAs that had an adjoining neighbor. Predictors were entered in the same fashion as the full data run and coefficient hazard ratio, its significance and magnitude explains similar effects as in the full data models. Results from the reduced data run, model-5 of table-2, report the average risk of FPCU founding across 492 CBSAs for 38 years. Model-5 excluded predictor variables cbsa_type,1 and 0 and Csa_type 1 and 0 because the procedure tested the effects of imitative founding in neighboring CBSAs. The results of model-5 assessing the effect of births in neighboring CBSAs are presented along with the full model results in table-2.

Model five results. In the reduced data set of 492 contiguous CBSAs, the effect of imitative founding in neighboring CBSAs was non-significant. Thus, in model-5, the effect of contagious founding was non-significant among 492 CBSAs. Seven predictors representing external environment were significantly correlated with the odds of FPCU founding in model-5.

In contrast to model-4 of full data run, growth in high school completion rates correlated significantly and negatively when the number of CBSAs was reduced. A one percent growth in high school completion rates correlated with 0.991 ($p<.05$) times or a one percent reduction in founding risk. The presence of public universities at the time of founding was non-significant in reduced data model-5, whereas it was positive and significant in the full data models.

Summary of findings

In sum, monitoring of 903 CBSAs for 38 years offers the following insights: MSAs with higher levels of economic integration, growth in CBSA's residential population, growth in college drop-out rates, growth service industry employment rates as a share of the total employment and earlier adoption of FPCU regional accreditation in CBSAs supported the likelihood of FPCU founding. Decline in unemployment rates, indicating growth in demand for human capital also correlated positively to risk of founding. The presence of public colleges and universities and pre-existing FPCUs in CBSAs at the time of founding significantly increased the odds of founding.

Contrary to expectations, growth in manufacturing to service job ratio and the presence of non-profit private colleges and universities in the founding environment reduced the chances of FPCU founding in CBSAs. CSA_type1=CBSAs that are part of a CSA, were non-significant to FPCU founding risk. Growth in high school completion rates, growth in per capita income of the CBSA and selectivity in admissions to public institutions were non-significant to FPCU founding risk in the overall data model.

Reduced Data Set Results—Decades

Introduction. The period specific models tested the influence of environmental predictors and FPCU founding risk in segmented time periods as decade. Thirty-eight years of

observations were segmented into four decades to observe the effects of predictor variables in each decade. The coefficient *hazard ratio* is the estimated effect of a predictor on the hazard or risk of FPCU founding in CBSAs at any point in a given decade. As mentioned in the method's chapter, three 10-year periods and one 8-year period constituted four decades in the period specific model. The predictor contagion is not included in period specific models due to fewer observations per decade as compared to the full model.

Figure 5. Cumulative Founding Hazard Rates by Decade of Observation

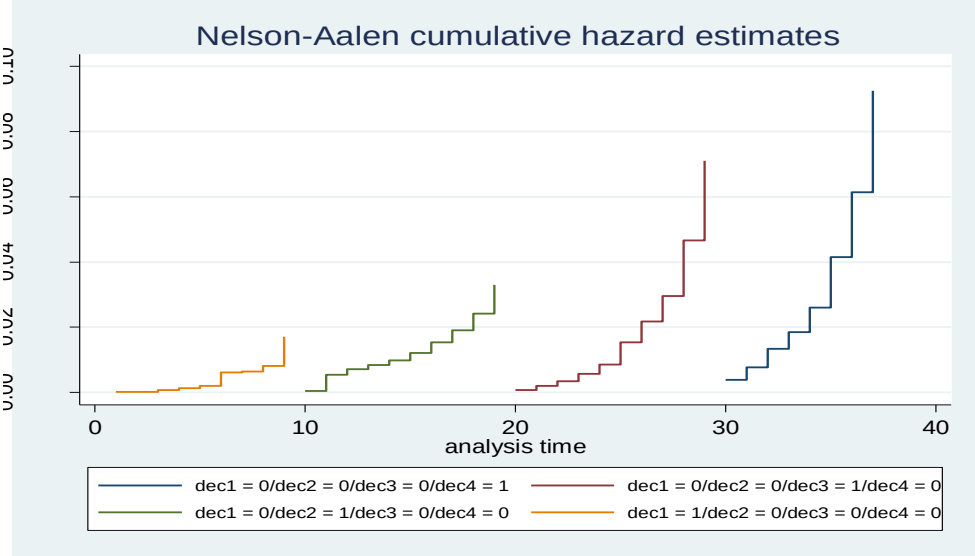


Figure 2 graphically displays the cumulative hazard estimates or the total risk rate for FPCU foundings in 903 CBSAs in each decade of observation. In decade one (1975-1984) the overall hazard rate or risk of founding was 0.02. In other words, 98 percent of 903 CBSAs survived from experiencing FPCU founding. There were 34 foundings in decade one. In decade two (1985-1994) the overall hazard rate was 0.03 or 97 percent of 903 CBSAs survived from FPCU founding. There were 117 foundings in decade two. In decade three (1995-2004) the overall hazard rate was 0.07 or 93 percent of 903 CBSAs survived from FPCU founding and there were 184 foundings. In decade four (2005-2015) the overall hazard rate was 0.09 or 91

percent of 903 CBSAs survived from FPCU founding and there were 231 foundings. Thus, the risk rate and number of FPCU foundings grew in each decade among 903 CBSAs observed.

As in the full data model, predictors were entered in a step-wise fashion to observe the stability of regression coefficients hazard ratios. The hazard ratio and its statistical significance explain the relationship between the environmental conditions in CBSAs and the likelihood of FPCU foundings. Hazard ratio indicates the magnitude of predictor effects and p-value indicates the statistical significance of the regression coefficient, hazard ratio. The hazard rate in period specific models is the conditional probability that FPCU birth occurs within the interval of a decade. The decade specific models tested *hypotheses 1 to 6* of the full model.

Decade specific results. The following paragraphs describe the hypotheses and the results of decade specific data models. Decade specific data run assessed the relationship between the predictors (same predictors of full data model) and FPCU founding risk. In the decade specific data run, the founding risk was assessed in ten year intervals instead of the entire 38-year period. In other words, decade specific data run assessed the risk of FPCU founding, for example from 1975-1984 in 903 CBSAs. Decade specific regression models sought to test hypotheses 1 to 6 of the full model (described in page 73)

Model for results. Table-5 displays results from model-4 of four-decade specific data run. The step-wise regression results of model-1 to modei-4 of decade one to decade four are included in Appendix A. The following paragraphs describe regression results from mode-4 of decade-1, decade-2 to decade-3 and decade-4. The table-5 as displayed below reports the average risk of FPCU foundings across 903 CBSAs by four decades of observations. Table-5 also reports the hazard ratio, simple error and robust errors of each predictor variable tested.

Table 5

Cox Regression Results Predicting the Founding Risk of FPCUs by Decade

Period Specific Models: 1975-2012
Cox regression Efron method for ties. (Std. Err. adjusted for 900 clusters in cbsacode)

		1975-1984	1985-1994	1995-2004	2005-2012
		Model 4	Model 4	Model 4	Model 4
Niche space	CBSA type 1=MSA	—	***5.473*** **	***7.925*** ***	***5.740*** **
		—	3.533	5.021	2.496
		—	3.630	5.333	2.821
	CBSA part of a CSA	***2.798***	***0.681***	***0.698***	***1.454*** *
		1.679	0.181	0.168	0.285
		1.805	0.265	0.228	0.297
	Log(population)	***1.639*** *	***2.802*** ***	***3.401*** ***	***2.161*** ***
		0.481	0.381	0.452	0.229
		0.475	0.447	0.584	0.316
	Three year change in % of high school completers	***1.027***	***0.984*** ***	***0.949*** ***	***1.086***
		0.031	0.006	0.016	0.051
		0.034	0.006	0.013	0.062
	Three year change in % with some college education	***0.941***	***1.046*** ***	***1.076*** ***	***0.973***
		0.073	0.015	0.024	0.050
		0.087	0.014	0.016	0.060
	Percent unemployed	***0.707*** **	***1.140***	***0.639*** ***	***0.625*** ***
		0.109	0.084	0.065	0.025
		0.112	0.115	0.109	0.042
	Service/manufacturing ratio	***0.981***	***0.542***	***0.027*** ***	***0.416*** *
		2.340	0.584	0.014	0.162
		2.286	0.724	0.027	0.183
	Three year change in % employed in service sector	***1.014***	***1.001***	***1.030*** ***	***0.996***
		0.054	0.004	0.009	0.017
		0.073	0.003	0.009	0.019
	Per capita income in $2012	***1.000***	***1.000***	***1.000***	***1.000***
		0.000	0.000	0.009	0.000
		0.000	0.000	0.000	0.000
Resource partitioni	Number of public univ. at time of founding	***0.954***	***1.120*** ***	***0.993***	***0.982***
		0.076	0.000	0.029	0.030
		0.069	0.047	0.052	0.038
	Number of nonprofit private univ. at time of founding	***0.999***	***0.945*** ***	***1.011***	***0.979***
		0.037	0.040	0.009	0.012
		0.035	0.016	0.016	0.016
	Public selectivity in admissions	***0.543***	***0.942***	***0.655***	***1.663*** **
		0.358	0.014	0.137	0.279
		0.265	0.281	0.189	0.424
	Number of FPCUs at time of founding	***35.538*** ***	***3.013*** ***	***4.652*** ***	***5.792*** ***
		12.831	0.292	0.473	0.451
		16.605	0.615	0.832	0.934
Normative diffusion	Exposure	***1.039***	***1.316*** **	***1.015***	***1.045***
		0.174	0.084	0.056	0.045
		0.136	0.153	0.088	0.077
Contagious diffusio	Founding in neighboring CBSAs	—	—	—	—
		—	—	—	—
		—	—	—	—
	Wald chi-square	791.090	1333.870	809.410	1237.7300
	Log-pseudolikelihood	-120.133	-681.144	-889.925	-1244.081

Significance: *** p<. 01; **p<.05; *p <10

Hazard Ratio in bold Italics. Standard Error and Robust Error below hazard ratio.

Geographic environments. In the first set of external environmental predictors pertaining to geographic environments, MSAs and population growth are significantly and positively correlated in all four decades. MSAs were positively correlated to FPCU founding risk than μSA in three out of four decades. In decade two MSAs correlated with 5.472 ($p<.05$) times or 447 percent foundings risk, in decade three MSAs correlated with 7.925 ($p<.001$) times or 693 percent and in decade three MSAs correlated 5.740 ($p<.05$) times or 474 percent of founding risk. A one-unit growth in population correlated with 3.879 ($p<.001$) times or 288 percent founding risk in decade three (1994-2004) and 1.639 ($p<10$) times or 69 percent founding risk in decade one (1975-1984). The magnitude of correlation coefficient hazard ratio is greatest in decade three and lowest in decade one. However, the geographic predictor, CSA (CBSA part of a CSA) correlated significantly and positively only in decade four (2004-2012).

Labor market environments. In the second set of external environmental predictors representing labor market conditions, growth in unemployment rate correlated significantly but negatively to founding risk in three out of four decades. A one percent growth in annual unemployment rate correlated with 0.707 ($p<.05$) times or 29 percent reduction in founding risk in decade one and 0.622 ($P<.001$) times or 38 percent reduction in founding risk in decade three and four. This suggests lower unemployment rates, in other words, higher demand for human capital supported the likelihood of FPCU founding in three out of four decades. Another labor market predictor, growth in college drop-out rates correlated positively and significantly with founding risk in decades two and three. A one percent growth in college dropout rate correlated with 1.046 ($p<.001$) times or five percent of founding risk in decade two and 1.078 ($p<.001$) times or eight percent founding risk in decade three. Finally, growth in high school completion

rates correlated significantly but negatively in decade two and three, suggesting a two to five percent reduction in founding risk.

Economic environments. Among the third set of external environmental predictors signifying the economic conditions in CBSAs, growth in service employment correlated positively and significantly in decade three (1995-2004) with founding risk. A one percent growth service industry employment correlated with 1.030 ($p<.001$) times or a 3 percent founding risk. But another economic predictor, growth in service-to-manufacturing job ratio correlated negatively and significantly in decade three, with 0.031 ($p<.001$) times or 97 percent reduction in founding risk.

Incumbent environments. The set of predictors representing resource sharing in the environment was the number of public and non-profit private colleges and universities in CBSAs. The incumbent public and non-profit private universities was significantly correlated to founding risk only in decade two. One public university in the founding environment correlated positively with 1.119 ($p<.001$) times or a 12 percent increase in founding risk in decade two, whereas one non-profit private in the founding environment correlated negatively with 0.941 ($p<.001$) times or a six percent reduction in founding risk. In all other decades, the presence of incumbent providers was non-significant to the risk of FPCU founding.

Prior foundings. The predictor representing self-duplication of the form, the number of prior foundings, correlated positively and significantly to the risk of additional founding in all four decades. In decade one, the correlation coefficient hazard ratio was greatest compared to other decades, one pre-existing FPCU in the founding environment correlated with 35.538 ($p<.001$) times or 3454 percent of risk for additional founding. In decade two although positive and significant, the magnitude of hazard ratio declined considerably. Presence of one pre-

existing FPCU in the founding environment correlated with 2.973 ($p<.001$) times or 197 percent risk for additional foundings. In decade three and four the magnitude of correlation coefficient increased but not to decade one levels. In decade three one pre-existing FPCU in the founding CBSA correlated with 4.463 ($p<.001$) times or 346 percent and in decade four one pre-existing FPCU correlated with 5.726 ($p<.001$) times or 473 percent risk for additional founding.

Institutional environment and spread of FPCUs. Exposure, the predictor signifying normative diffusion of the form was positive and significant only in decade two. A one more year of FPCU regional accreditation in a CBSA correlated with 1.311 ($p<.05$) times or 31 percent of founding risk. In all other decades exposure was non-significant to the risk of FPCU founding.

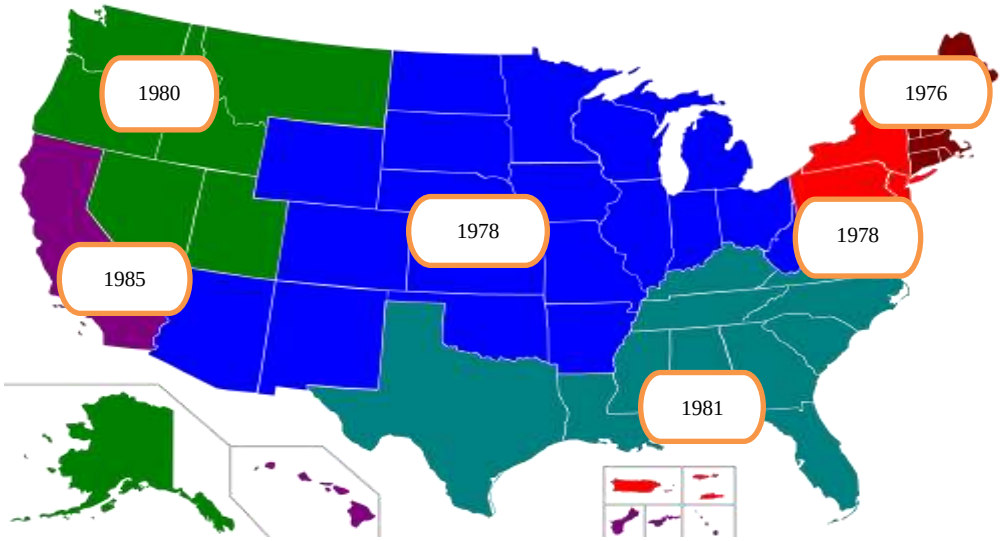
Summary of findings

In sum, monitoring of 903 CBSAs by time periods offers the following insights. The MSAs representing higher levels of economic integration, the growth in CBSA population and the presence of pre-existing FPCUs were the most consistent predictors of FPCU founding in all four decades. Growth in college drop-out rates was positive in two out of four decades. Demand for human capital indicated by lower unemployment rates supported FPCU foundings in decades one, three and four. Growth in service industry jobs influenced the founding risk positively only in decade three. The presence of public universities supported the odds of FPCU founding only in decade two and publics' selectivity in admissions supported founding risk only in decade four. Exposure, indicating the duration of FPCU regional accreditation in the founding environment was positive only in decade two. As in the full model growth in the per capita income of the CBSA was non-significant across all four decades.

Reduced Data Set Results—Regions

Introduction. The region specific models tested the influence of environmental predictors and FPCU founding risk in six geographic regions as defined by the regional accrediting agencies of the US. A total of 903 CBSAs were segmented by region and each region had 38 years of observations. The region specific data run includes three regression models for regions two, three, four, five and six, estimating the risk of FPCU foundings in respective regions. Region one, the New England states has only two models due to fewer CBSAs in this region. Figure 6 displays six geographical regions and the commencing year of FPCU accreditation.

Figure 6. Geographic Regions by Regional Accrediting Agencies



Legend:

MSA (Middle States Association of Colleges and Schools) NEASC (New England Association of Schools and Colleges)

NCA (North Central Association of Colleges and Schools) NAC (Northwest Accreditation Commission)

SACS (Southern Association of Colleges and Schools) WASC (Western Association of Schools and Colleges)

Source: Regional accreditation#/media/File

Region one-New England. The New England Association of Schools and Colleges (NEASC) accredit post-secondary institutions in the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. NEASC was one of first regional

accreditors to admit FPCUs. The New England region represented three percent of the CBSAs in the country. Due to the small sample size of CBSAs in this region, I was not able to run a regression model-3, for one of the predictors, the number of prior founding. Hence region one data run includes only two models. A total of 17 foundings were observed for this region. Results from New England region data run, report the average risk of FPCU founding across 26 CBSAs for 38 years of observation (see Appendix A for complete Region-1 results)

***Region two Middle States*.** The Middle States Association (MSA) accredits colleges and universities in the states of New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia. This region represents eight percent of the CBSAs in the country. A total of 90 foundings were observed in this region. Results from middle states data run report the average risk of FPCU founding across 74 CBSAs for 38 years of observation (see appendix A for complete Region-2 results).

***Region three North Central States*.** The North Central Association (NCA) of colleges accredit colleges and universities in the states of Arkansas, Arizona, Colorado, Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, North Dakota, Nebraska, New Mexico, Ohio, Oklahoma, South Dakota, Wisconsin, West Virginia, and Wyoming. North Central is the largest of the six accrediting regions in the country and it represents 43 percent of the CBSAs in the country. A total of 209 foundings were observed in this region. Results from North Central states data run, report the average risk of FPCU foundings across 383 CBSAs for 38 years of observation (see Appendix A for complete region-3 results).

Region four North West. The Northwest Accreditation Commission (NAC) on colleges and universities accredit postsecondary institutions in Alaska, Idaho, Montana, Nevada, Oregon, Utah, and Washington. It represents nine percent of the CBSAs in the country. A total of 53

foundings were observed in this region. Results from North West states data run, report the average risk of FPCU founding across 83 CBSAs for 38 years of observation (see Appendix A for complete region-4 results).

Region five South. The Southern Association of Colleges and Schools (SACS) accredit institutions in the states of, Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia. The Southern region, the second largest among six regions represents 33 percent of the CBSAs in the nation. A total of 165 foundings were observed in this region. Results from South states data run, report the average risk of FPCU founding across 297 CBSAs for 38 years of observation (see Appendix A for complete region-5 results).

Region six Western. The Western Association of Schools and Colleges (WASC) accredit institutions in the states of California and Hawaii. This region represents four percent of the CBSAs in the country. A total of 50 foundings were observed in this region. Results from Western states data run, report the average risk of FPCU founding across 35 CBSAs for 38 years of observation (see Appendix A for complete region-6 results).

In the region specific data runs, predictors were entered in a step-wise fashion to observe the stability of regression coefficients (hazard ratio). The hazard ratio and its statistical significance explain the relationship between the environmental conditions in CBSAs and the likelihood of FPCU foundings. Hazard ratio indicates the magnitude of predictor effects and p-value indicates the statistical significance of the regression coefficient, hazard ratio. *Exposure* was excluded because of collinearity with regions and *contagion* was excluded because of the reduced data size of region specific data sample.

Regions data set results. The following paragraphs describe the hypotheses and the results of region specific data models. Region specific data run assessed the relationship between the same predictors tested the in full data run and FPCU founding risk by geographical jurisdictions of six regional accrediting agencies in the US. In the region specific data run, the founding risk was assessed by regions for the entire observation period of 38 years. Region specific regression models sought to test hypotheses 1 to 5 of the full model. Hypothesis-6 on exposure to regional accreditation was not included in region specific model due to collinearity of predictor exposure with regions. Table-6 below displays, hazard ratio, simple error and robust error terms for the predictors tested in region specific data runs.

Model three results. Table-6 displays results from model-3 of region specific data run for regions two to six and model-2 results for region one. Unlike other regions, region one had only a very sample of CBSAs, hence Cox regression did not have large enough sample run a regression on the predictor variable prior founding. The step-wise regression results of model-1 to model-3 for regions two to region six and model-1 and model-2 results for region-1 are included in Appendix A. The following paragraphs describe results from the last model of each region.

Table 6

Cox Regression Results Predicting the Founding Risk of FPCUs by Region

Accrediting Regions 1 to 6
Cox regression Efron method for ties (Std. Err. adjusted for number of clusters in cbsacode by region)

	Region 1 Model 2	Region 2 Model 3	Region 3 Model 3	Region 4 Model 3	Region 5 Model 3	Region 6 Model 3
CBSA type 1=MSA	***1.873***	***0.018 ******	***7.743 *******	—	***22.498 ******	***3.578 *****
	3.839	0.032	2.997	—	23.508	10.082
	3.184	0.040	3.778	—	25.086	2.725
CBSA part of a CSA	***0.184***	***5.054***	***0.918***	***7.858 ******	***1.595***	***0.548***
	0.425	7.610	0.184	7.988	0.357	0.232
	0.419	5.917	0.330	8.399	0.598	0.231
Log(population)	***7.330***	***1686.883 *******	***3.583 *******	***3.522 ******	***4.118 *******	***4.481 ******
	6.412	1771.678	0.407	1.831	0.694	1.675
	9.892	4645.260	0.549	3.177	1.064	2.764
Three year change in % of high school completers	***0.787***	***1.032***	***1.108 *******	***3.004 ******	***0.954***	***0.924 *******
	0.133	0.032	0.016	0.801	0.034	0.016
	0.118	0.021	0.024	1.308	0.059	0.021
Three year change in % with some college education	***2.823 *******	***0.857 *****	***0.871 ******	***0.665 ******	***1.072***	***1.246 *******
	0.511	0.084	0.031	0.075	0.044	0.058
	0.418	0.075	0.051	0.116	0.073	0.079
Percent unemployed	***0.891***	***0.778 ******	***0.533 *******	***0.808 ******	***0.935***	***1.017***
	0.210	0.141	0.032	0.080	0.047	0.094
	0.167	0.092	0.043	0.091	0.073	0.076
Service/manufacturing ratio	***0.003 ******	***0.000 *******	***0.042 *******	***0.001 *******	***0.037 *******	***0.004 *******
	0.007	0.000	0.019	0.001	0.017	0.004
	0.009	0.000	0.024	0.002	0.027	0.005
Three year change in % employed in service sector	***0.794 *******	***1.097 ******	***1.040***	***0.804 ******	***1.007***	***0.904 *******
	0.073	0.048	0.019	0.048	0.006	0.027
	0.061	0.052	0.030	0.077	0.005	0.035
Per capita income in $2012	***1.000***	***1.000 ******	***1.000 *******	***1.000 *******	***1.000 ******	***1.000 *******
	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	1.000	0.000
Number of public univ. at time of founding	***0.069 ******	***0.885***	***0.866***	***3.119 *******	***0.896***	***0.624***
	0.068	0.062	0.063	0.908	0.059	0.233
	0.089	0.071	0.137	1.325	0.107	0.347
Number of nonprofit private univ. at time of founding	***1.702 ******	***0.907 *****	***1.002***	***1.197 *******	***0.966***	***1.062***
	0.366	0.040	0.014	0.089	0.034	0.059
	0.423	0.048	0.030	0.083	0.086	0.081
Public selectivity in admissions	***3.498***	***1.923***	***0.974***	***0.014 *****	***4.197 *******	***0.000 *******
	3.680	0.735	0.245	0.026	1.191	0.000
	3.957	0.776	0.569	0.031	1.852	0.000
Number of FPCUs at time of founding	—	***5.938 *******	***6.824 *******	***9.271 *******	***10.056 *******	***3.321 *******
	—	1.543	0.652	2.445	1.232	0.590
	—	2.767	1.344	5.180	2.390	0.700
Exposure to regional accreditation	—	—	—	—	—	—
(omitted due to collinearity)	—	—	—	—	—	—
	—	—	—	—	—	—
Founding in neighboring CBSAs		—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—
	—					
Number of clusters by cbsacode	26	74	383	83	297	35
Wald chi-square	3568.480	2573.300	1080.860	2135.220	1037.870	418.220
Log-pseudolikelihood	-44.651	-140.954	-1046.311	-149.463	-758.424	-156.824

Significance: *** p<. 01; **p<.05; *p <10

Hazard Ratio in bold Italics. Standard Error and Robust Error below hazard ratio.

Geographical Environments. Among the geographical predictors representing external environment, population correlated positively and significantly to the risk of FPCU founding in five out of six regions. New England was the only region where population was non-significant to the risk of founding. The magnitude of correlation coefficient hazard ratio was significantly greater in Middle States region compared to all other regions, where a one-unit growth in population correlated with 1686.88 ($p<.001$) times or of founding risk. In other regions, a one-unit growth in population correlated with four to six times of founding risk. Middle States region is the home of several large, highly populated and economically integrated CBSAs in the country.

MSA, another geographical predictor pertaining to urbanization, correlated positively and significantly in two regions-the North Central region and the West region. In the North Central region MSA correlated 7.742 ($p<.05$) times or 674 percent of founding risk compared to Micropolitan areas (cbsa_type 0). In the Western region, MSA correlated 3.578 ($p<10$) times to founding risk. CSA indicating CBSAs that are part of a combined statistical area correlated positively and significantly only in one region, the North West—CBSAs that were part of a CSA were 7.858 ($p<.05$) times more likely to have FPCU founding.

Labor market environments. Among the three predictors representing labor market conditions in the founding environment, growth in college dropout rates correlated significantly with founding risk in all regions except the West region. In the New England and the South regions, growth in college dropout rates correlated positively, but in Middle States, North Central and North West regions growth in college drop-out rates correlated negatively to founding risk. In the New England region, a one percent growth in college drop-out rate correlated with 2.823

($p<.05$) times or 182 percent founding risk and in the South region it correlated with 1.246 ($p<.001$) times or 25 percent of founding risk.

Another labor market predictor, growth in high school completion rates correlated positively in two regions, North Central and North West. A one percent growth in high school completion rates correlated with 3.004 ($p<.05$) times or 200 percent of founding risk. In the North Central region, it correlated with 1.108 ($p<.05$) times or 11 percent of founding risk.

Finally, the third labor market predictor correlated significantly and negatively in three out of six regions. A one percent growth in unemployment rate correlated with 22 percent reduction in founding risk in the Middle States, 47 percent reduction in founding risk in the North Central region and 19 percent reduction in founding risk in the North West region. In other words, in these three regions lower unemployment rates indicating higher demand for human capital correlated with the risk of FPCU foundings.

Economic environments. Among the economic environment predictors, growth in service-to-manufacturing ratio correlated significantly and negatively across all six regions. On the average a one percent growth in service-to-manufacturing ratio correlated with 95 percent reduction in founding risk across the regions. Another economic environment predictor, growth in service employment correlated significantly and positively only in the Middle States region, although it was positive in the full model. A one percent growth in service industry employment correlated with 1.097 ($p<.05$) times or a 10 percent of founding risk in the Middle States region.

Incumbent environment. Incumbent environment is represented by the number of public and non-profit private universities and selectivity in admission to publics in CBSAs, at the time of the founding. The number of public universities correlated positively and significantly only in the North West region. Presence of one public university in the founding environment correlated

with 3.119 (p<.001) times or 211 percent of founding risk in the North West region. Non-profit private universities correlated positively and significantly in two regions —in the New England region and in the North West region. One non-profit private university correlated with 1.702 (p<.05) times or 70 percent founding risk in the North West region and one non-profit private correlated with 1.197 (p<.001) times or 20 percent of founding risk in the New England region. Selectivity in admission to public universities correlated significantly and positively only in one region, the South. A one-point increase in selectivity correlated with 4.341 (p<.001) times or 334 percent of founding risk in the South region.

Prior foundings. Pre-existing FPCUs at the time of founding correlated positively and significantly across all five regions. One pre-existing FPCU in the founding environment correlated with 5.938 (p<.001) times or 494 percent in Middle States, 6.824 (p<.001) times or 582 percent in the North Central region, 9.271 (p<.001) times or 827 percent in the North West region, 9.647 (p<.001) times or 864 percent in the South region and 3.321 (p<.001) times or 232 percent in the West region to the odds of additional founding. Thus density driven self-generating duplication of the FPCU form was significant and positive across five regions. New England region had insufficient data to run a regression model on prior founding.

Summary of findings

In sum, 38 years of observing six accrediting regions of the US offers the following insights. The growth in CBSA's population and the presence of existing FPCUs was the most common predictor of FPCU founding in regions. MSAs, defined as cbsa_type 1, indicating higher levels of economic and social integration (OMB definition of MSA-robust transportation infrastructure indicating higher levels of economic and social integration) was a positive influence in two out of the six regions observed—North Central and West regions. Labor market

conditions represented by growth in college drop-out rates correlated positively to founding risk in two out of six regions—New England and West regions. Growth in high school completion rates positively influenced FPCU foundings in two out of six regions- North Central and North West regions. Demand for human capital indicated by lower unemployment rate supported FPCU founding in three out of six regions—Middle States, North Central and North West. On the economic front, growth in service-to-manufacturing job ratio was a common negative influence across all six regions. Growth in service industry employment was a positive correlation in the Middle States region and in other regions it was either negative or non-significant to FPCU founding risk. As in the full model and decades' models, growth in per capita income of the CBSA was non-significant across all six regions.

The presence of incumbent public universities in the founding CBSAs was positively correlated to FPCU founding risk only in the North West region. The number of non-profit universities in the founding CBSAs correlated positively in two out of six regions- New England and North West regions. Selectivity in admissions to publics was positively correlated to founding risk only in the South region. Thus, overall three regions were observed as having positive influence of incumbent presence to the likelihood of FPCU founding. Pre-existing FPCUs in the founding CBSAs were a positive correlation in five out six regions. New England region did not have sufficient data to run a regression on prior founding.

Chapter 5

Discussion

Overview

This study aimed to offer an explanation for the emergence of degree granting For-Profit Colleges and Universities (FPCUs) that came into existence in the US since the passage of the Higher Education Act of 1972. This chapter summarizes the study, discusses the findings, and suggests both conclusions and ideas for future research on FPCU foundings and proliferation. Using two organizational founding theories, population ecology (Hannan & Freeman, 1989) and Neoinstitutionalism (DiMaggio & Powell, 1975; Scott, 2005), I argue that the changes in the founding environment of FPCUs could offer us insights into the rationale for the emergence of this form. I examined the relative influence of several factors that may explain the founding and the spread of degree granting FPCUs in the colleges and universities organizational field.

Using event-history data on FPCU foundings and environmental conditions of the founding locations (CBSAs) from 1975-2012, I assessed the effect of ecological and institutional predictors on the odds of FPCU foundings. The study relied on five factors to explain FPCU births in higher education that were found to be instrumental in explaining the emergence of new organizational forms in other mature industries. These factors were niche space formation in the founding environment, resource partitioning or sharing of resources among providers of similar services, self-duplication of the organizational form due to presence of prior founding, spread of the organizational form due to changes in the professional environment of the industry and imitative founding in adjoining CBSAs.

As mentioned in chapter one and two, the scope of this study is limited to the four year or above degree granting FPCUs, that represent 21 percent of the for-profit higher education universe and 25 percent of the four-year or above degree granting segment.

Discussion

This quantitative correlational study was based on the assumption that internal and external environments of higher education industry and institutional changes could explain the likelihood of FPCU foundings in the US from 1975-2012. The findings of this study offer strong support for ecological and institutional arguments. Overall, urbanization as population growth and economic integration in a CBSA had the strongest effect on FPCU foundings, supporting the arguments of resource formation resulting from changes in the environment. Prior founding in CBSAs also had strong effect on additional foundings, supporting the argument of density dependent self-duplication. In other words, the presence of one pre-existing FPCU in the founding environment correlated with risk for three additional foundings in the overall model. Ecological factors signifying changes in the resource environment ranked as the second best predictor. A one-unit growth in the residential population of the CBSA correlated with four-fold increase in the odds of FPCU foundings. This was followed by changes in the labor market conditions, in which growth in the share of people with incomplete college degrees and higher demand for labor resources correlated strongly with the odds of FPCU foundings.

Population growth was a reliable predictor of FPCU foundings. The growth in CBSA's population was a strong and consistent predictor of FPCU foundings in the full model, in the decade models, and in five out six geographic region models. As the density of population increased in CBSAs the risk of founding also increased. Nationally, a one-unit increase in population correlated with three-fold increase in the founding risk. In highly populated MSAs the risk rate was exponentially higher than the national rate. For example, in the Middle States region the risk rate correlated with 1687 times for every unit of population growth (1:1687). Important to note, Middle States region is the home of highly populated MSAs such as the New

York, NY MSA, Philadelphia, PA MSA and the Washington, DC MSA. The study results show that New York had the highest number of foundings (35) and Washington DC MSA ranked second (20) in the nation. The Philadelphia MSA with seven foundings ranked in the top ten percent of MSA with FPCU foundings. The micropolitan areas that experienced FPCU foundings also had very high rate of population growth.

MSAs increased the odds of foundings. Not only growth in residential population but also higher levels of economic integration in metropolitan statistical areas (MSAs) increased the risk for foundings. Overall, MSAs were six times more likely to experience FPCU founding than μSAs or micropolitan areas. The effects of MSA were much higher in North Central region and South region which represented highest shares of the MSAs in the country. MSAs were twenty two times more likely to have FPCU foundings in South region and eight times more likely to have FPCU founding in the North Central states. Among the 165 CBSAs that experienced FPCU foundings 152 were MSAs. Overall 40 percent of MSAs in the country experienced FPCU foundings. Thus a higher level of economic integration represented by robust commuting facilities in CBSAs was a strong predictor of FPCU foundings.

The population ecology theory suggests that the changes in the external environment of the industry could support the formation of a narrow range of resources or niche space which could facilitate the emergence of new organizational forms (Freeman & Hannan, 1983; Carroll, 1985). As mentioned in chapter two, organizational niche refers to variation in production capacities and resource requirements among organizations within a population. Population ecologists suggest that not only formation of new resource spaces but also the flow of the resources could be instrumental in the founding of new organizational forms (Delacroix & Solt, 1988; Romanelli, 1989). Thus growth in the residential population of CBSAs along with robust

transportation facilities in metropolitan statistical areas supported the formation and flow of a narrow range of resources (students) that facilitated FPCU foundings.

Prior foundings generated more foundings. The internal environment of higher education industry was another consistent predictor of FPCU foundings in the entire country and for the 38 years of observation. This was a counter intuitive finding since for-profit colleges are often portrayed as an unwelcome player in higher education field by media, politicians and other observers. Overall nationally, one pre-existing FPCU in a CBSA at the time of founding correlated with three-fold risk for additional founding. The time interval data run by decade further explains this effect of prior founding. In decade-one, for example, one prior founding correlated with risk for 36 additional foundings, suggesting a very high rate (1:36) of density dependent self-duplication. The idea of density dependence suggests that at low density levels or in the early stages of FPCU emergence, each new founding in CBSAs facilitate the legitimation process and therefore increased founding rates (Hannan, 1986). Meyer and Scott (1983) say legitimation of an organizational form indicates that their use is widely accepted in the environment and they have acquired the status of taken for granted.

Moreover, an examination of annual founding rates confirms this improving legitimacy. From 1975 to 1990 the annual founding rate was nine FPCUs per year but from 2000-2012 the annual founding rate was 28 FPCUs per year. These results suggest that the improving legitimacy attracted more resources in the early stages of FPCU founding (Hannan, 1986; Meyer & Scott, 1983). But in the 1990s founding rates declined and this trend correlates with federal government crackdown on for-profit sector's misuse of title IV funds (McGuire, 2012). Again, FPCU founding rates spiked up during the last decade of this observation suggesting an overabundance of resources such as non-traditional age college students and Wall Street

investments in this sector (Kinser, 2006; McGuire, 2012). The region specific data run results also suggest this phenomena was not concentrated in one region but across geographic regions of the country

These results, the population growth, MSA formation and the effects of prior foundings indicate the interplay of institutional legitimacy and support of the resource formation correlating with the FPCU founding hazard. Remarkably, despite the persistent public criticism on for-profit colleges, prior founding in CBSAs improved the legitimacy of the form and as perception of legitimacy increased the rate of imitative foundings across six geographic regions and four decades of observation.

Public colleges and universities increased the odds of founding. Not only incumbent for-profit colleges but also incumbent public colleges and universities correlated positively to the risk of FPCU founding. One public university in a CBSA correlated with a five percent increase in the risk for FPCU founding. Although expected, this was another counter-intuitive insight since we assume market leaders such as public colleges and universities would present entry barriers to new organizational forms to enter in the field. Another notable finding was the positive effect of selectivity in undergraduate admission to public institutions in the South region and in the fourth decade of observation, although selectivity was not significant in the full model. The IPEDS survey of institutional characteristics indicates that public institutions in the Southern states region are more selective in undergraduate admissions when compared to other regions (IPEDS, 2012). The selectivity definition in this study is based on IPEDS' selectivity scale of 0 to 4, "0" being open admissions and "4" most selective. A one-point increase in selectivity for undergraduate admissions in the South correlated with a four-fold increase in FPCU founding

risk. Southern states region represents 28 percent (165) of all founding in the country and are second only to the North Central region (209) in terms of number of foundings.

Moreover, in decade-four (2005-2012), a one-point increase in selectivity in undergraduate admissions to public institutions correlated with a 70 percent increase in founding risk nationally. Although decade-four constituted only 8 years of observations, 41 percent of FPCU births occurred in decade-four of the observation (289/584). This suggests that public colleges were leaving out (not admitting) more potential students through their admission policies in the fourth decade than prior decades. It is worth noting that in recent years publicly funded institutions have come under pressure to improve student outcome and that in turn could have increased selectivity in admissions (NCHEMS, 2013). Although the level of ouctome based funding varies from 5 percent of the total state support to 100 of the state support, most states have some level of outcome based funding (NCHEMS, 2013). Consequently, public colleges increasingly shared more student resources with emerging FPCUs in the last decade, thus overall improving the founding rates in the last decade of this observation.

Interestingly, presence of non-profit private universities correlated negatively to the risk of FPCU founding. Presence of one non-profit private institution correlated negatively with three percent reduction in founding risk. This result indicates that, nationally non-profit private colleges competed with FPCUs for resources. But in the New England region and in the North West region, non-profit privates correlated positively to FPCU foundings risk. This could suggest that in New England and in North West region, non-profit privates left out (not admit) more potential students, thus they shared resources with the emerging FPCUs. The lens of organizational founding theories could shed more light into this disparate effect of incumbent public and non-profit private institutions in the foundings environment.

Organizational theorists suggest that different types or organizational forms in an industry may have different type of production capacities and resource requirements (Abernathy& Clark, 1985; Romanelli, 1991). Carroll (1985) suggests that in concentrated markets, generalist and specialist organizations operate in distinct resource spaces. In other words, they seek different types of customers. Generalists often target the center of the resource space while specialists focus on the resources left out on the periphery (Carroll, 1985). The positive correlation of public colleges and universities to FPCU founding risk suggests that they could be operating in distinct resource spaces, thus not competing in the same resource space with FPCUs. On the contrary, the negative correlation of non-profit privates to the risk of FPCU founding suggests competition between non-profit privates and for-profit privates. Thus they must be operating in similar resource space to some extent.

Furthermore, with increased market concentration (total output produced in an industry by few firms) in degree granting education field, generalists such as public colleges and universities operate in the center of the market. A review of undergraduate enrollments in the public colleges and universities for the last four decades illustrates this fact. A majority of the undergraduate population, as high as 95 percent, at these institutions are of traditional college age 18 to 24 years, often residing in campus based housing (IPEDS IC, 1984-2012). This trend indicates the non-traditional age student market, 25 plus year olds and college drop-outs, are not addressed by public colleges (Berg, 2005; Kinser, 2006; Morey, 2004). In such a situation, niche providers and startups such as FPCUs can draw on peripheral resources without entering into direct competition with the public colleges and universities. Moreover, growth in peripheral resources such as more college drop-outs and stop-outs seeking degree completion could increase the founding rate of niche providers such as FPCUs. In sum, the internal environment

of higher education industry was the leading predictor of FPCU foundings in the last four decades.

Demand for labor increased the odds of founding. Besides the effects of urbanization, the changes in the human capital environment also supported FPCU foundings. The rise in demand for human capital was another strong predictor of FPCU founding risk. Rising demand for labor resources indicated by lower unemployment rates were found to be positively correlated to FPCU founding risk in the full model. Growth in employment rates was a positive predictor of FPCU foundings in three out of four decade models and three out of six region models. Thus higher employment rates supported the formation of resource niches such as working students. Moreover most working students have access to tuition support from their employers in addition to access to federal student financial aid. Thus a narrow band of resource formation in the higher education environment supported the odds of FPCU foundings.

Demand for college degrees among 25 plus year olds increased the odds of founding. Along with the demand for labor, the supply side of human capital was positively related to FPCU founding risk. Supply side of human capital represents the skills and knowledge of potential employees and active employees. The growth in the share of college drop-outs over the age of 25 was a strong predictor of FPCU founding in the full model. Overall, a one percent growth in college drop-out rates correlated with 3 percent founding risk in the full model. However, the founding risk was higher in decade two (5 percent) and in decade three (8 percent). In the regions models, New England region and West (California and Hawaii) region had the highest risk rate related to college drop-out rates. A one percent rise in college drop-out rates correlated with 182 percent of founding risk in New England region and 24 percent risk in the Western states region.

These results support the notion that changes in buyer preferences or development of new client groups may lead to the creation of new resource spaces in the organizational founding environment (Delacroix & Solt, 1988; Swaminathan, 1995). The growth in 25 plus year olds who had not completed a degree along with the demand for more human capital in the form of college degrees created a new resource niche for FPCU founding (Autor, Levy & Murnane, 2002). Narrowly defined resource streams such as the demand for college degree completion among adult workers along with an overall increase in demand for labor resources increased the founding chances of FPCUs. Thus changes in the demand side and supply side of human capital increased the risk of FPCU foundings in the country.

The availability of regional accreditation and the founding risk. As expected, the availability of regional accreditation in the founding environment was a strong predictor of FPCU founding risk. Each additional year of FPCU regional accreditation in CBSAs correlated with 33 percent more risk for FPCU founding. The neo-institutionalist view of organizational legitimacy suggests that political and social forces confer legitimacy to new organizational forms (Meyer and Rowan 1977; Scott 1998). The positive influence of regional accreditation (number of years' regional accreditation was available in CBSAs) represents not only the appropriateness of FPCUs as colleges, but also it qualifies FPCUs for federal student financial aid. The accreditation by a federally approved agency such as the regional accrediting agency is a federal government requirement to qualify for title IV funds (HEA, 1972), the most important financial resource in higher education today. Therefore, the predictor exposure representing number of years a CBSA was exposed to regional accreditation signified not only appropriateness of the form by professional associations, practically, it also represented rational or legal legitimacy by

arising from compliance to federal laws. This perceived legitimacy of the form supported its diffusion in the country.

The employment and income conditions and the founding risk. Contrary to expectations, the economic environment of the CBSA had only limited influence on the odds of FPCU foundings. Growth in service industry employment suggests a one-to-one risk. A one percent growth in service industry employment correlated with one percent risk for FPCU founding. Surprisingly, growth in manufacturing-to-service jobs correlated negatively to founding risk. On average, when manufacturing jobs were replaced by service jobs at a higher rate, it reduced the chances of FPCU founding by about 95 percent. This suggests that when service jobs grew as a share of total jobs in a CBSA, the likelihood of FPCU founding was positive, whereas when manufacturing jobs were replaced by service jobs at higher rate, the likelihood of founding was negative.

Summary

This national longitudinal study of FPCU births suggests that the strongest predictors of FPCU foundings in the US for the last four decades were changes in the internal and external environment of higher education industry. Among the external conditions, urbanization of geographies, rise in demand for workers, demand for college degree credentials among people over the age of 25 and rise in service industry employment were the strongest predictors of FPCU founding. The institutional or internal environment of higher education also supported FPCU foundings. As expected, the availability of regional accreditation, signifying the appropriateness of FPCUs as a college/university form increased FPCU founding chances.

Organizational theorists like Romanelli (1989) argued that "virtually any event or development that could fundamentally alter existing flows of resources-e.g. changes in social

values, the discovery or depletion of natural resources, changes in the demography of a human population, economic growth or decline, and so on—can effect a change in organizational resource space" (p.95) and support the emergence of new organizational forms in mature industries. In this study, the theoretical lens of population ecology and Neoinstitutionalism helped to account for some of the environmental forces that effected change in the higher education resources space which supported the emergence of a third sector in the degree granting field.

Policy Implications

Although this study results are based on the analysis of historical data, there are insights and implications for policy and practice. As Shakespeare noted in his play Tempest "what's past is prologue." The conditions that supported the emergence of a new sector in higher education must have implications for the industry. As mentioned in chapter one, this study results aimed to support higher education policy and practice development by providing observed evidence on the origins of FPCUs as a third sector in higher education. The observed evidence suggests that ecological and the institutional environments of higher education industry were instrumental in the emergence of this third sector in higher education.

The FPCU form emerged in areas with very high population density and robust public transportation infrastructure. Today, 98 percent of the FPCUs are located in 152 largest metropolitan areas of the country. OMB data says 85 percent of US population resides in such metropolitan areas (OMB, 2012). This trend is indicative of mass migration of people from rural areas to urban areas. United Nation's population studies call this type of population re distribution "rural flight" (UN, 2014). This study results suggests that this rural flight seems to be one of the factors that supported the emergence of FPCU sector in the US. The emergence

and diffusion of FPCUs in the largest urban centers of the US also suggests that there is an increase in demand for access to college education among urban dwellers. This urban demand for college education has implications for governmental agencies interested economic development in urban areas, since human capital in the form of college degrees are an important part of the present day knowledge economy. Additionally, physical access to urban college campuses through affordable and easy to use transportation infrastructure has implication for state and city governments that want to support human capital development.

This study results suggests that the new urban college market is largely comprised of non-traditional age students in other words working adults. New FPCUs and other institutions interested in expanding into the urban college markets must make their presence in the urban centers of the country. Today less than 50 percent of all public and non-profit private institutions have a presence in the urban centers of America (IPEDS 2012), although 85 percent of the US population resides in MSAs. Tierney (2012) says courses offered at convenient times in accessible locations are not a minor point when students are routinely shut out of classes at public colleges and state universities (Huffington Post, Oct.12, 2012).

Human capital conditions that supported birth and diffusion of FPCUs also have policy implications for incumbent providers and public policy makers. The differentiated demand for college education, specifically degree completion for people over the age of 25, was not offered through incumbent public and non-profit private college channels in the early decades of FPCU foundings. Although, publics and non-profit privates have moved into this market recently, FPCUs still are the leading providers of college education for working adults (Berg, 2005; Kelly, 2001; Morey, 2004). Tierney and Hentschke (2007) say for-profits seems to understand the needs of working adult college market better.

Regarding public policy related to non-traditional college markets, federal legislation and funding policies have been supportive of for-profits beginning with the GI bill of 1948 to the Higher Education Act of 1972 and its several subsequent reauthorizations. A previous president of American Educational Research Association (AERA) William J. Tierney summed up the present need for policy development best. Tierney (2012) says "I happen to be someone who believes that they (for-profits) are essential to the country's welfare" (www.huffingtonpost.com). Furthermore, he says, we need to help them reform and develop responsible regulations that ensure both consumer protection and a vibrant postsecondary sector. Thus the need for regulations and incentives for reforms in the FPCU sector has policy implications for federal and state governments.

This study results suggests not only the supply side of human capital (people needing college degrees) but also the demand side of human capital conditions supported the emergence of FPCUs. Contrary to prevalent notions of lower demand for labor correlating with higher demand for educational services, the chances for FPCU founding was significantly higher when the demand for labor was higher, indicated by lower unemployment rates. A one percent increase in labor demand correlated with up to 47 percent of founding risk in 38 years of observation. This finding has policy implications for federal and state governments in terms of funding and supporting college degree completion for non-traditional age students and workers in times of high employment as well. Presently, federal and state governments are more supportive of re-skilling people in times of high unemployment, but re-skilling people during low unemployment are also essential.

Jamie P. Merisotis, president of Lumina Foundation for Education says FPCUs have a big role in worker training and improving graduation rates among populations that historically

struggled to complete degrees. Moreover, he adds, for-profits will be essential if the nation is to meet the Obama administration's college completion benchmark (Gonzalez, 2009).

The results of this study suggest, nationally, non-profit private colleges and for-profit private colleges compete in the same or similar resource space. In the full model, presence of one non-profit private college reduced FPCU founding risk by three percent, indicating competition for resources. Thus this study suggests that at the national level there is some competition between for-profit colleges and non-profit colleges for resources. A Vanderbilt University study says that in the 10 years leading up to 2013, on average, five private non-profit colleges and universities have closed per year, as many as nine were closed in 2009 (NCES, Digest of Education Statistics, 2013).

Although a direct correlation between FPCU foundings and non-profit college closings cannot be established through this study, it is interesting to note that on average between 2000-2012, 28 FPCUs were founded annually. Susan Fitzgerald, a senior vice president at Moody's investor services says "we expect that there will be more college (non-profit private) closures over the next three to four years" (Berman, 2015 p.1). Non-profit private colleges particularly those that draw students from local regions in areas like the rural Northeast and some of the Midwest are at risk of closing (Segosebe & Shepherd, 2013). The emergence and diffusion of FPCUs in the highly populated MSAs of the country, compared to the closures of non-profit private colleges in the rural areas suggests the importance of geographic location in the college and university industry today.

An institutional condition that directly supported the emergence of FPCU sector is the opening of regional accreditation for FPCUs. Regional accreditation was an essential requirement to offer four year degrees of similar status as that of the public and non-profit

private institutions. The study results show that in 1986 there was a 900 percent increase in FPCU foundings from the previous year. It is important to note that by 1985 all six regional accrediting agencies were open for FPCU accreditation. Western region that included California was one of the last region to open for FPCU accreditation. A valid regional accreditation indicates normative legitimacy of the form. Regional accreditors define not only goals but also they designate appropriate ways to pursue those goals for colleges and universities (Scott, 2014). Normative legitimacy stresses the logic of "appropriateness" and a valid regional accreditation not only indicate appropriate methods of offering college education, but to an enduring loyalty to the purpose behind doing the job in the first place (Selznick, 1957). Therefore, regional accreditors must focus on developing policies and practices that assure the appropriateness of the FPCU operation in the degree granting field. Recently, Senator Elizabeth Warren at a senate hearing on for-profit colleges said it succinctly, "if accrediting agencies aren't willing to stand up against colleges that (they accredited) are breaking the law, colleges that are cheating their students, then I don't know what good they do," she added. "And I sure don't know why we would let them determine which colleges are eligible for federal dollars" (Inside Higher Ed, October 15, 2015).

This study results indicate limited competition between for-profit and non-profit colleges and there is no quantifiable competition for students between FPCUs and public colleges. Higher education scholars such as Tierney and Hentschke (2007) have noted that FPCUs are a disruptive innovation in the industry. They argued that FPCUs disrupted the industrial organization of higher education and diffused in the environment. Others scholars argued that FPCUs have disruptively innovated by commoditizing faculty resources (Morey, 2004; Slaughter & Rhodes, 2004). Soley (1998) says for-profit institutions are redefining the meaning of higher

education while challenging the idea of academic freedom. Christensen and Eyring (2011) are of the opinion that organizational innovations among traditional players (publics and non-profit privates) have been incremental or sustaining only. In other words, traditional college and universities innovated on the existing technologies and markets rather than creating a new markets and value networks, which could eventually disrupt the existing market and value network.

At the institutional level, it is important to consider the evolving competitive environment of higher education industry, including the role FPCUs are playing in student enrollments, faculty hiring and facility use. As a matter of administrative practice, organizational planners must understand the evolving competitive trends and disruptive innovations in the industry. Although traditional colleges and universities may not be one innovation away from extinction, disruptive innovations of FPCUs on the fringes of the industry could have an eroding effect in the long run.

In sum, policy development and planning for higher education at the federal, the state and at the institutional levels must take into account societal changes that seemed to have supported the emergence of a third sector in college education—such as mass migration of people from rural to urban areas, development of large urban centers, changes in the demand and supply of labor market resources and changes in the institutional environment. The emergence of a third sector in the colleges and university organization field indicates the demand for an alternate path to degree completion for non-traditional college students. At the national level, these changes have implication for federal policies on how to legislatively and financially support access to higher education for non-traditional students and urbanites. There have been limited initiatives from the federal government to support alternate service models, in addition to federal support

for FPCUs. Offering a path to federal funding under Title IV for "direct assessment or competency-based programs" is one such initiative.

Research Implications

This event-history study is a first step effort towards understanding the rationale for the emergence of degree granting for-profit colleges and universities in US higher education industry, historically a non-profit industry. One of the purposes of this study was to initiate a theory based discussion on the emergence of a third sector in the degree granting field. In order to accomplish that, I tested five concepts based on two organizational founding theories. Among them, the variables representing the economic environment of the CBSAs had inconsistent results. Most surprisingly, the overall growth in service industry employment supported FPCU foundings, whereas the shift in employment from manufacturing to services negatively correlated to foundings risk. Although both predictors indicate growth in service industry employment, only the overall service industry job growth supported FPCU founding risk. In this study, the service employment predictor included all types of service jobs and it would be interesting to see if any specific type of service industry employment such as the financial services or the professional services would improve the odds of FPCU foundings.

Another economic factor that requires further investigation is the income condition of the CBSAs and its relation to FPCU foundings. This study results suggest growth in per capita income of the CBSA had no effect on FPCU foundings. Often, FPCUs are described as operators preying on poor minorities and economically disadvantaged people (Harkin, 2012). Therefore, income levels and its relation to founding risk could be explored through other income predictors such as personal income, wages and salaries.

Although this study examined the normative environment of colleges and universities and the risk of FPCU foundings, the influence of the legal environment of higher education and the emergence FPCUs could give us a more complete historical context for FPCU emergence. Thus, the research on this topic could be extended by assessing the influence of numerous legislative changes and its relation to FPCU foundings starting with the GI bill of 1948 to Higher Education Act 1972 and its numerous re-authorizations. If FPCUs are indeed a disruptive innovation in the higher education industry that created new markets and new networks, then it would be important to find out how this innovation influenced the strategies and activities of incumbent public and non-profit private colleges in the industry. Does the commoditization of college curriculum and faculty work that FPCUs have been credited with have any influence in the rest of the industry? (Kinser, 2006; Morey, 2004; Tierney & Hentschke, 2007)

CBSA traits were found be predictive of FPCU foundings. For example, CBSA traits such as robustness of transportation infrastructure and density of population were found to be predictive of FPCU founding. But there are many other CBSA traits that could further help explain the emergence of FPCUs in large metropolitan areas. For example, the political climate, entrepreneurial affinity and the demographic diversity of the CBSAs could help us better understand the emergence of this third sector. Furthermore, although the CBSAs were very useful in accounting for environmental changes, another geographical unit such as the fifty states may help account for the state level changes and the foundings risk.

Although this study analyzed the conditions that supported the emergence of the FPCU form, much more is not known about their longevity as an organizational form. Hence, not only the births but also the changes in the organizational landscape must be examined to better understand the survival of an organization form. Future research on the rate of transformation

of FPCUs through mergers and acquisition will help us to understand the evolution of this third sector in higher education. For example, the liability of newness and the liability of smallness are important topics of investigation in newly emerged organizational populations. There is much more to learn about the survival of this organizational form amidst intense criticism, competitive pressures and controversies. For example, how did public opinion shape this sector? Thus, studying the environment where FPCU emerged, transformed, still surviving and in some cases thriving may help us to understand the dynamics of organizational evolution in higher education industry.

Conclusions

This study focused on understanding the rationale for the emergence and spread of for-profit colleges and universities in higher education. Study results suggests that environmental changes such as urbanization, changes in the employment environment, student resources, federal government support and institutional support helped FPCUs to emerge and diffuse in the country. Other observers are of the opinion that FPCUs changed the environment of the industry itself (Kinser, 2006; Morey, 2004; Slaughter &Rhodes, 2004; Ruch 2001). Tierney and Hentschke (2007) argued that FPCU are innovators in the industry because they sought changes in the federal laws and managed to create a shift in public policy. Tierney and Hentschke and other scholars maintain that FPCUs innovated by commoditized teaching and learning and by doing so they improved access to disadvantaged student population not served by traditional providers such as public and non-profit private colleges (Morey, 2004; Slaughter and Rhodes, 2004). Although these assertions are not mutually contradictory, it indicates the complexity of the topic —understanding the emergence of a third sector, a profit driven sector in a traditionally non-profit industry is complex.

Consequently, this study results are only a partial explanation for FPCU foundings. A complete treatment of a specialist organization such as the FPCUs in a mature industry like higher education requires analysis of both founding and mortality rates. Assessing the effects and relative importance of environmental mechanism such as those modeled in this study on both the founding and the mortality processes would help us to better understand the complexity of FPCU evolution in higher education industry.

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Appendix A

Table 1

Full Data Set Run
Cox regression Efron method for ties. (Std. Err. adjusted for 897 clusters in cbsacode)

		Model 1	Model 2	Model 3	Model 4
Niche space	CBSA type 1=MSA	4.888 ***	5.453 ***	7.810 ***	6.376 ***
		1.460	1.665	2.389	1.956
		1.690	1.986	2.854	2.262
	CBSA part of a CSA	1.188	1.140	1.202	1.093
		0.145	0.140	0.148	0.134
		0.235	0.232	0.245	0.208
	Log(population)	4.325 ***	4.425 ***	3.461 ***	4.207 ***
		0.196	0.243	0.200	0.276
		0.460	0.495	0.432	0.483
	Three year change in % of high school completers	0.970 ***	0.968 ***	0.989 *	0.992
		0.003	0.003	0.004	0.004
		0.006	0.006	0.006	0.006
	Three year change in % with some college education	1.074 ***	1.078 ***	1.027 **	1.024 *
		0.007	0.007	0.009	0.008
		0.015	0.015	0.014	1.024
	Percent unemployed	0.794 ***	0.809 ***	0.796 ***	0.790 ***
		0.022	0.023	0.022	0.022
		0.032	0.034	0.042	0.048
	Service/manufacturing ratio	0.068 ***	0.059 ***	0.062 ***	0.042 ***
		0.014	0.013	0.014	0.010
		0.032	0.025	0.028	0.020
	Three year change in % employed in service sector	1.003	1.002	1.009 ***	1.006 **
		0.002	0.002	0.002	0.002
		0.004	0.004	0.002	0.002
	Per capita income in $2012	1.000 *	1.000 *	1.000 **	1.000 *
		0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		1.004	1.061	1.049 *
			0.015	0.018	0.017
			0.037	0.039	0.028
	Number of nonprofit private univ. at time of founding		1.005	0.982	0.971 ***
			0.005	0.006	0.006
			0.011	0.011	0.008
	Public selectivity in admissions		0.676 **	0.659 **	1.183
			0.064	0.065	0.128
			0.126	0.137	0.226
Density dependence	Number of FPCUS at time of founding			2.769 ***	3.267 ***
				0.106	0.134
				0.234	0.352
Normative diffusion	Exposure to regional accreditation				1.334 ***
					0.038
					0.082
Contagious diffusion	Founding in neighboring CBSAs	—	—	—	—
	Wald chi-square	995.390	1199.630	1867.480	1734.940
	Log-pseudolikelihood	-3970.999	-3831.527	-3534.597	-3468.070

Significance: *** p<. 01; **p<.05; *p< 10

Table 2

Period Specific-Decade 1:1975-1984
Cox regression Efron method for ties. (Std. Err. adjusted for 900 clusters in cbsacode)

		Model 1	Model 2	Model 3	Model 4
Niche space	CBSA type 1=MSA	—	—		—
		—	—		—
		—	—		—
	CBSA part of a CSA	1.216	1.145	2.835	2.798
		0.630	0.604	1.693	1.679
		0.668	0.682	1.815	1.805
	Log(population)	4.062 ***	4.259 ***	1.616	1.639 *
		0.845	1.239	0.462	0.481
		0.921	1.381	0.481	0.475
	Three year change in % of high school completers	0.971	1.044	1.028	1.027
		0.029	0.037	0.031	0.031
		0.075	0.068	0.033	0.034
	Three year change in % with some college education	1.001	1.089	0.935	0.941
		0.092	0.097	0.068	0.073
		0.183	0.158	0.073	0.087
	Percent unemployed	0.663 ***	0.632 ***	0.702 *	0.707 **
		0.073	0.079	0.106	0.109
		0.063	0.070	0.103	0.112
	Service/manufacturing ratio	0.449	0.671	0.972	0.981
		1.033	1.627	2.309	2.340
		0.857	1.314	2.245	2.286
	Three year change in % employed in service sector	1.047	0.908	1.017	1.014
		0.066	0.048	0.052	0.054
		0.193	0.084	0.069	0.073
	Per capita income in $2012	1.000 **	1.000 ***	1.000	1.000
		0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		1.056	0.953	0.954
			0.061	0.075	0.076
			0.074	0.066	0.069
	Number of nonprofit private univ. at time of founding		0.982	1.002	0.999
			0.023	0.034	0.037
			0.026	0.031	0.035
	Public selectivity in admissions		1.172	0.508	0.543
			0.512	0.303	0.358
			0.446	0.246	0.265
	Number of FPCUs at time of founding			35.376 ***	35.538 ***
				12.679	12.831
				16.136	16.605
Normative diffusion	Exposure				1.039
					0.174
					0.136
	Wald chi-square	538.280	553.270	771.690	791.090
	Log-pseudolikelihood	-195.055	-175.680	-120.159	-120.133

Significance: *** p<. 01; **p<.05; *p <10

Table 3

Period Specific-Decade 2: 1985-1994
Cox regression Efron method for ties. (Std. Err. adjusted for 897 clusters in cbsacode) Model-6 165 clusters)

		Model 1	Model 2	Model 3	Model 4
Niche Space	CBSA type 1=MSA	3.973 **	4.472 **	6.406 **	5.473
		2.493	2.902	4.129	3.533
		2.619	3.025	4.281	3.630
	CBSA part of a CSA	0.568	0.564	0.666	0.688
		0.148	0.149	0.177	0.183
		0.244	0.249	0.263	0.269
	Log(population)	3.073 ***	2.936 ***	2.305 ***	3.000 ***
		0.326	0.382	0.285	0.402
		0.442	0.497	0.342	0.508
	Three year change in % of high school completers	0.972 ***	0.971 ***	0.984 ***	0.984 ***
		0.005	0.005	0.006	0.006
		0.005	0.005	0.006	0.006
	Three year change in % with some college education	1.072 ***	1.073 ***	1.042 ***	1.046 ***
		0.012	0.013	0.015	0.015
		0.012	0.014	0.014	0.014
	Percent unemployed	0.970	0.980	1.086	1.141
		0.063	0.068	0.110	0.084
		0.084	0.090	0.079	0.115
	Service/manufacturing ratio	0.355	0.358	0.539	0.607
		0.371	0.377	0.561	0.657
		0.474	0.479	0.695	0.822
	Three year change in % employed in service sector	0.998	0.998	1.004	1.002
		0.003	0.003	0.004	0.004
		0.003	0.003	0.003	0.003
	Log(income)	1.000	1.000	1.000	1.000
		0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		1.004	1.142 ***	1.119 ***
			0.029	0.040	0.040
			0.023	0.045	0.047
	Number of nonprofit private univ. at time of founding		1.001	0.954 **	0.941 ***
			0.011	0.014	0.014
			0.008	0.018	0.017
	Public selectivity in admissions		0.940	0.553 **	0.962
			0.202	0.130	0.246
			0.237	0.164	0.281
Density Dependence	Number of FPCUS at time of founding			2.385 ***	2.973 ***
				0.178	0.287
				0.227	0.594
Normative diffusion	Exposure to regional accreditation				1.311 **
					0.084
					0.150
Contagious diffusion	Founding in neighboring CBSAs				—
					—
					—
	Wald chi-square	1602.720	1562.360	1494.010	1459.960
	Log-pseudolikelihood	-768.236	-751.365	-692.730	-683.410

Significance: *** p<. 01; **p<.05; *p< 10

Table 4

Period Specific- Decade 3: 1995-2004
Cox regression Efron method for ties. (Std. Err. adjusted for 900 clusters in cbsacode)

		Model 1	Model 2	Model 3	Model 4
Niche space					
	CBSA type 1=MSA	3.338	3.560	7.987	7.925
		2.100	2.264	5.055	5.021
		2.207	2.394	5.372	5.333
	CBSA part of a CSA	0.955	0.882	0.712	0.709
		0.217	0.202	0.173	0.172
		0.270	0.264	0.236	0.236
	Log(population)	4.592 ***	5.147 ***	3.794 ***	3.878 ***
		0.394	0.535	0.460	0.517
		0.459	0.637	0.755	0.859
	Three year change in % of high school completers	0.930 ***	0.926 ***	0.946 ***	0.947 ***
		0.016	0.017	0.016	0.016
		0.014	0.015	0.013	0.013
	Three year change in % with some college education	0.557 ***	1.114 ***	1.072 ***	1.078 ***
		0.025	0.025	0.024	0.024
		0.082	0.021	0.016	0.016
	Percent unemployed	0.557 ***	0.570 ***	0.618 ***	0.625 ***
		0.050	0.054	0.060	0.063
		0.082	0.090	0.102	0.111
	Service/manufacturing ratio	0.074 ***	0.065 ***	0.031 ***	0.031 ***
		0.033	0.030	0.016	0.016
		0.066	0.055	0.031	0.031
	Three year change in % employed in service sector	1.037 ***	1.033 ***	1.031 ***	1.030 ***
		0.008	0.009	0.009	0.009
		0.010	0.009	0.009	0.009
	Per capita income in $2012	1.000	1.000	1.000	1.000
		0.000	0.000	0.000	0.009
		0.000	0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		0.998	0.990	0.989
			0.026	0.028	0.028
			0.031	0.053	0.051
	Number of nonprofit private univ. at time of founding		0.996	1.008	1.007
			0.009	0.009	0.009
			0.009	0.016	0.017
	Public selectivity in admissions		0.579 ***	0.640 *	0.670
			0.092	0.111	0.138
			0.114	0.165	0.194
	Number of FPCUs at time of founding			4.439 ***	4.463 ***
				0.443	0.449
				0.791	0.818
Normative diffusion	Exposure to regional accreditation				1.022
					0.056
					0.090
Contagious diffusion	Founding in neighboring CBSAs				
		—	—	—	—
		—	—	—	—
		—	—	—	—
	Wald chi-square	800.500	860.040	928.020	941.760
	Log-pseudolikelihood	-1051.288	-1002.965	-896.599	-896.519

Significance: *** p<. 01; **p<.05; *p<10

Table 5

Period Specific Decade 4: 2005-2012
Cox regression Efron method for ties. (Std. Err. adjusted for 900 clusters in cbsacode)

		Model 1	Model 2	Model 3	Model 4
Niche space					
	CBSA type 1=MSA	4.593 ***	4.021 **	5.943 ***	5.740 ***
		1.907	1.716	2.576	1.367
		2.199	1.985	5.372	2.496
	CBSA part of a CSA	1.712 ***	1.682 ***	1.518 **	1.474 *
		0.327	0.321	0.295	0.290
		0.338	0.327	0.300	0.301
	Log(population)	3.054 ***	3.337 ***	2.157 ***	2.262 ***
		0.224	0.283	0.204	0.239
		0.270	0.344	0.284	0.347
	Three year change in % of high school completers	0.967	0.974	1.091	1.088
		0.062	0.064	0.052	0.051
		0.106	0.115	0.064	0.063
	Three year change in % with some college educati	1.178 **	1.176 **	0.976	0.972
		0.069	0.069	0.051	0.051
		0.096	0.099	0.060	0.061
	Percent unemployed	0.663 ***	0.677 ***	0.626 ***	0.622 ***
		0.028	0.029	0.025	0.025
		0.032	0.034	0.042	0.042
	Service/manufacturing ratio	0.440 **	0.418 **	0.471 *	0.438 *
		0.144	0.145	0.179	0.171
		0.184	0.173	0.198	0.197
	Three year change in % employed in service secto	0.964	0.961	0.992	0.995
		0.014	0.015	0.017	0.017
		0.023	0.023	0.018	0.019
	Per capita income in $2012	1.000 *	1.000	1.000	1.000
		0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		0.966	0.985	0.982
			0.028	0.030	0.030
			0.039	0.039	0.038
	Number of nonprofit private univ. at time of founding		0.998	0.977	0.976
			0.009	0.012	0.012
			0.011	0.017	0.016
	Public selectivity in admissions		0.896	1.588 *	1.692 **
			0.134	0.251	0.283
			0.206	0.385	0.429
Density Dependence	Number of FPCUs at time of founding			5.724 ***	5.726 ***
				0.446	0.445
				0.929	0.923
Normative diffuison	Exposure to regional accreditation				1.048
					0.045
					0.077
Contagious diffusion	Founding in neighboring CBSAs				—
					—
					—
	Wald chi-square	699.360	578.490	966.180	1066.5400
	Log-pseudolikelihood	-1496.881	-1459.852	-1248.224	-1247.643

Significance: *** p<. 01; **p<.05; *p <10

Table 6

Region 1; New England States
Cox regression Efron method for ties. (Std. Err. adjusted for 26clusters in cbsacode)

		model 1	model 2
Niche space	CBSA type 1=MSA	0.875	1.873
		1.209	3.839
		1.277	3.184
	CBSA part of a CSA	24.207	0.184
		36.155	0.425
		55.148	0.419
	Log(population)	2.385 *	7.330
		1.163	6.412
		1.171	9.892
	Three year change in % of high school completers	0.735 **	0.787
		0.124	0.133
		0.103	0.118
	Three year change in % with some college education	2.765 ***	2.823 ***
		0.500	0.511
		0.530	0.418
	Percent unemployed	0.756	0.891
		0.168	0.210
		0.132	0.167
	Service/manufacturing ratio	0.015 **	0.003 **
		0.026	0.007
		0.027	0.009
	Three year change in % employed in service sector	0.825 **	0.794 ***
		0.069	0.073
		0.079	0.061
	Per capita income in $2012	1.000	1.000
		0.000	0.000
		0.000	0.000
Resource partitioning	Number of public univ. at time of founding		0.069 **
			0.068
			0.089
	Number of nonprofit private univ. at time of founding		1.702 **
			0.366
			0.423
	Public selectivity in admissions		3.498
			3.680
			3.957
	Number of FPCUs at time of founding		—
			—
			—
Normative diffusion	Exposure to regional accreditation		—
	(omitted due to collinearity)		—
			—
Contagious diffusion	Founding in neighboring CBSAs		—
			—
			—
	Wald chi-square	1579.590	3568.480
	Log-pseudolikelihood	-50.757	-44.651

Significance: *** p<. 01; **p<.05; *p <10

Table 7

Region 2: Middle States
Cox regression Efron method for ties. (Std. Err. adjusted for 74 clusters in cbsacode)

		Model 1	Model 2	Model 3
Niche space	CBSA type 1=MSA	1.124	0.027 *	0.018 *
		1.193	0.042	0.032
		1.232	0.049	0.040
	CBSA part of a CSA	5.557 *	5.751 ***	5.054
		5.749	7.766	7.610
		5.726	6.301	5.917
	Log(population)	17.585 ***	1183.536 ***	1686.883 ***
		3.929	1125.414	1771.678
		10.985	2801.148	4645.260
	Three year change in % of high school completers	0.941 **	1.023	1.032
		0.012	0.031	0.032
		0.017	0.028	0.021
	Three year change in % with some college education	0.989	0.901	0.857 *
		0.062	0.084	0.084
		0.062	0.074	0.075
	Percent unemployed	0.631 ***	0.711 ***	0.778 **
		0.075	0.118	0.141
		0.080	0.084	0.092
	Service/manufacturing ratio	0.000 ***	0.000	0.000 ***
		0.000	0.000	0.000
		0.000	0.000	0.000
	Three year change in % employed in service sector	1.096 ***	1.090 **	1.097 **
		0.035	0.046	0.048
		0.037	0.046	0.052
	Per capita income in $2012	1.000	1.000	1.000 **
		0.000	0.000	0.000
		0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		0.837 **	0.885
			0.053	0.062
			0.063	0.071
	Number of nonprofit private univ. at time of founding		0.967	0.907 *
			0.036	0.040
			0.035	0.048
	Public selectivity in admissions		2.232 **	1.923
			0.834	0.735
			0.917	0.776
	Number of FPCUs at time of founding			5.938 ***
				1.543
				2.767
Normative diffusion	Exposure to regional accreditation			—
	(omitted due to collinearity)			—
				—
Contagious diffusion	Founding in neighboring CBSAs			—
				—
				—
	Wald chi-square	865.700	974.650	2573.300
	Log-pseudolikelihood	-283.564	-165.513	-140.954

Significance: *** p<. 01; **p<.05; *p <10

Table 8

Region 3: North Central
Cox regression Efron method for ties. (Std. Err. adjusted for 383 clusters in cbsacode)

		Model 1	Model-2	Model 3
Niche space				
	CBSA type 1=MSA	5.705 ***	5.156 ***	7.743 ***
		2.142	1.988	2.997
		2.786	2.535	3.778
	CBSA part of a CSA	1.001	1.035	0.918
		0.191	0.199	0.184
		0.351	0.370	0.330
	Log(population)	4.256 ***	4.732 ***	3.583 ***
		0.375	0.496	0.407
		0.451	0.715	0.549
	Three year change in % of high school completers	1.035 ***	1.041 ***	1.108 ***
		0.013	0.014	0.016
		0.014	0.015	0.024
	Three year change in % with some college educatio	1.010	1.009	0.871 **
		0.031	0.032	0.031
		0.040	0.045	0.051
	Percent unemployed	0.748 ***	0.757 ***	0.533 ***
		0.038	0.040	0.032
		0.039	0.040	0.043
	Service/manufacturing ratio	0.046 ***	0.036 ***	0.042 ***
		0.019	0.015	0.019
		0.024	0.023	0.024
	Three year change in % employed in service sector	1.010	1.007	1.040
		0.014	0.015	0.019
		0.015	0.016	0.030
	Per capita income in $2012	1.000 ***	1.000 **	1.000 ***
		0.000	0.000	0.000
		0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		0.919	0.866
			0.060	0.063
			0.105	0.137
	Number of nonprofit private univ. at time of founding		1.000	1.002
			0.013	0.014
			0.022	0.030
	Public selectivity in admissions		0.992	0.974
			0.223	0.245
			0.412	0.569
Density Dependence	Number of FPCUs at time of founding			6.824 ***
				0.652
				1.344
Normative diffusion	Exposure to regional accreditation			—
	(omitted due to collinearity)			—
				—
Contagious diffusion				
	Founding in neighboring CBSAs			—
				—
				—
	Wald chi-square	727.820	728.670	1080.860
	Log-pseudolikelihood	-1251.312	-1248.263	-1046.311

Significance: *** p<. 01; **p<.05; *p <10

Table 9

Region 4: North West
Cox regression Efron method for ties. (Std. Err. adjusted for 83 clusters in cbsacode)

		Model 1	Model-2	Model 3
niche space	CBSA type 1=MSA	—		—
		—		—
		—		—
	CBSA part of a CSA	2.161	3.237	7.858 **
		1.769	2.899	7.988
		1.990	2.705	8.399
	Log(population)	13.594 ***	7.489 **	3.522 **
		5.293	3.731	1.831
		8.878	6.403	3.177
	Three year change in % of high school completers	1.718	2.157	3.004 **
		0.370	0.550	0.801
		0.608	1.084	1.308
	Three year change in % with some college education	0.895	0.807	0.665 **
		0.085	0.088	0.075
		0.132	0.160	0.116
	Percent unemployed	0.805 ***	0.798 **	0.808 **
		0.068	0.076	0.080
		0.067	0.079	0.091
	Service/manufacturing ratio	0.018 ***	0.016 ***	0.001 ***
		0.015	0.015	0.001
		0.024	0.024	0.002
	Three year change in % employed in service sector	0.860 **	0.826 **	0.804 **
		0.041	0.046	0.048
		0.065	0.092	0.077
	Per capita income in $2012	1.000 ***	1.000 ***	1.000 ***
		0.000	0.000	0.000
		0.000	0.000	0.000
resource partitioning	Number of public univ. at time of founding		1.761	3.119 ***
			0.389	0.908
			0.680	1.325
	Number of nonprofit private univ. at time of founding		1.053	1.197 ***
			0.064	0.089
			0.094	0.083
	Public selectivity in admissions		0.225	0.014 *
			0.275	0.026
			0.430	0.031
	Number of FPCUs at time of founding			9.271 ***
				2.445
				5.180
normative diffusion	Exposure to regional accreditation			—
	(omitted due to collinearity with regions)			—
				—
contagious diffusion				
	Founding in neighboring CBSAs			—
				—
				—
	Wald chi-square	375.290	1444.250	2135.220
	Log-pseudolikelihood	-200.588	-197.084	-149.463

Significance: *** p<. 01; **p<.05; *p <10

Table 10

Region 5: South
Cox regression Efron method for ties. (Std. Err. adjusted for 297 clusters in cbsacode)

		Model 3	Model 4	Model 5
Niche space	MSA	15.390 ***	10.352 **	23.508
		15.784	10.784	23.508
		16.140	11.227	25.086
	CSA	1.274	1.295	1.595
		0.275	0.281	0.357
		0.291	0.278	0.598
	Log(population)	4.889 ***	6.931 ***	4.118 ***
		0.546	1.140	0.694
		0.654	1.399	1.064
	Three year change in % of high school completers	1.008	0.974	0.954
		0.036	0.034	0.035
		0.086	0.059	0.065
	Three year change in % with some college educati	1.027	1.053	1.071
		0.041	0.043	0.045
		0.099	0.072	0.082
	Percent unemployed	0.822 ***	0.929	0.923
		0.042	0.050	0.048
		0.050	0.075	0.077
	Service/manufacturing ratio	0.021 ***	0.021 ***	0.034 ***
		0.010	0.010	0.015
		0.014	0.014	0.023
	Three year change in % employed in service secto	1.005	1.005	1.007
		0.006	0.006	0.006
		0.011	0.011	0.009
	Per capita income in $2012	1.000	1.000	1.000 **
		0.000	0.000	0.000
		0.000	0.000	0.000
Resource partitioning	Number of public univ. at time of founding		0.843	0.845
			0.058	0.057
			0.125	0.113
	Number of nonprofit private univ. at time of founding		0.945	0.948
			0.033	0.035
			0.064	0.073
	Public selectivity in admissions		4.341 ***	4.341 ***
			1.221	1.221
			1.826	1.826
Density Dependence	Number of FPCUs at time of founding			9.647 ***
				1.208
				2.290
	Wald chi-square	806.290	743.530	868.910
	Log-pseudolikelihood	-926.975	-919.588	-758.424

Significance: *** p<. 01; **p<.05; <*p 10

Table 11

Region 6: West
Cox regression Efron method for ties. (Std. Err. adjusted for 35 clusters in cbsacode)

		Model 1	Model 2	Model 3
niche space 1	CBSA type 1=MSA	0.243	4.910 **	3.578 *
		0.290	13.277	10.082
		0.260	3.775	2.725
	CBSA part of a CSA	0.384 **	0.354 **	0.548
		0.148	0.147	0.232
		0.183	0.189	0.231
	Log(population)	6.344 ***	4.233 **	4.481 **
		1.394	1.475	1.675
		2.208	2.686	2.764
niche space 2	Three year change in % of high school completers	0.963	0.957	0.924 ***
		0.017	0.018	0.016
		0.026	0.028	0.021
	Three year change in % with some college education	1.092	1.113	1.246 ***
		0.052	0.056	0.058
		0.078	0.088	0.079
	Percent unemployed	0.910	0.919	1.017
		0.086	0.088	0.094
		0.077	0.078	0.076
niche space 3	Service/manufacturing ratio	0.002 ***	0.002 ***	0.004 ***
		0.002	0.002	0.004
		0.003	0.003	0.005
	Three year change in % employed in service sector	0.999	0.983	0.904 ***
		0.029	0.031	0.027
		0.039	0.044	0.035
	Per capita income in $2012	1.000 ***	1.000 ***	1.000 ***
		0.000	0.000	0.000
		0.000	0.000	0.000
resource partitioning	Number of public univ. at time of founding		0.917	0.624
			0.333	0.233
			0.532	0.347
	Number of nonprofit private univ. at time of founding		1.059	1.062
			0.057	0.059
			0.084	0.081
	Public selectivity in admissions		0.000 **	0.000 ***
			0.000	0.000
			0.000	0.000
	Number of FPCUs at time of founding			3.321 ***
				0.590
				0.700
Normative diffusion	Exposure to regional accreditation			—
				—
				—
Contagious diffusion	Founding in neighboring CBSAs			—
				—
				—
	Wald chi-square	537.410	470.020	418.220
	Log-pseudolikelihood	-191.810	-189.019	-156.824

Significance: *** p<. 01; **p<.05; *p<10